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NAS WHITING FIELD
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RECORD OF DECISION OPERABLE UNIT (OU) 27 SITE 41 FORMER PESTICIDE STORAGE
BUILDING 1485C SURFACE AND SUBSURFACE NAS WHITING FIELD FL
11/29/2011
NAS WHITING FIELD

RECORD OF DECISION

Operable Unit 27 - Site 41 Former Pesticide Storage Building 1485C Surface and Subsurface Soil



**Naval Air Station Whiting Field
Milton, Florida
USEPA ID No. FL2170023244**

1.0 DECLARATION

1.1 SITE NAME AND LOCATION

Operable Unit (OU) 27 – Site 41, Former Pesticide Storage Area Building 1485C, at Naval Air Station (NAS) Whiting Field, Milton, Florida, United States Environmental Protection Agency (USEPA) ID number FL2170023244. The site location is presented in Figure 1-1.

1.2 STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) presents the Selected Remedy for surface and subsurface soil at OU 27 - Site 41, Former Pesticide Storage Area Building 1485C, which was chosen by the Navy and USEPA in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on information contained in the Administrative Record for the site. The Florida Department of Environmental Protection (FDEP) concurs with the Selected Remedy.

1.3 ASSESSMENT OF SITE

The response action selected in this ROD is necessary to protect the public health and welfare or the environment from releases of hazardous substances into the environment. A remedial action is required because concentrations of carcinogenic polynuclear aromatic hydrocarbons (cPAHs) and dieldrin in soil pose unacceptable risk to human health under current and future land use scenarios.

1.4 DESCRIPTION OF SELECTED REMEDY

The major components of the Selected Remedy for Site 41 include:

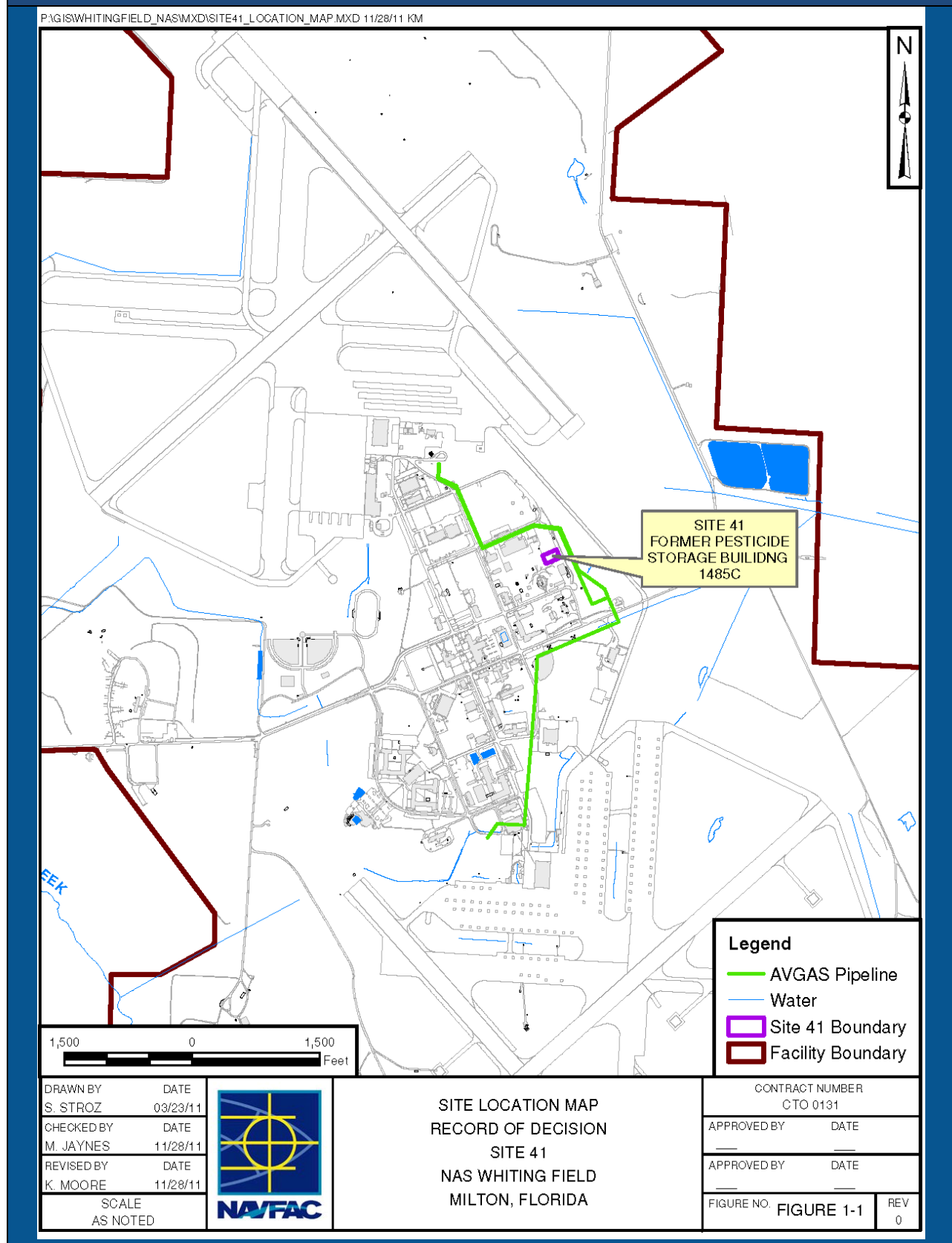
- Excavation and off-site disposal of soil with concentrations of cPAHs and dieldrin greater than FDEP direct exposure commercial/industrial Soil Cleanup Target Levels (SCTLs).
- Implementation of land use controls (LUCs) to ensure that future use of the property is limited to non-residential activities and to prohibit excavation and uncontrolled removal of soil from the site.

The Selected Remedy will eliminate unacceptable risks by precluding exposure to soil with contaminant of concern (COC) concentrations greater than FDEP commercial/industrial SCTLs (FDEP, 2005) and by implementing LUCs to limit future site uses to non-residential activities and to preclude disturbance of the soils without prior authorization. The remediation of Site 41 will not adversely impact the current and reasonably anticipated future land use of the site as a storage and equipment lay-down area. The Selected Remedy is expected to achieve substantial long-term risk reduction and allow the property to be used for the reasonably anticipated future land use, which is industrial. This ROD documents the final remedial action for Site 41 soil and does not include or affect any other sites at the facility. Groundwater at NAS Whiting Field is being addressed separately as Site 40 and will be addressed in a future decision document. There is no surface water or sediment associated with Site 41.

Environmental work at Site 41 is part of the Navy's ongoing Installation Restoration (IR) Program, which includes 27 OUs at NAS Whiting Field. The IR Program is a Department of Defense program to investigate and, if necessary, cleanup conditions related to suspected past releases of hazardous materials at military facilities. Currently, 24 of the 27 OUs at NAS Whiting Field have final RODs documenting remedy selection, and remedy implementation at those OUs has either been completed or is ongoing.

Implementation of the remedy at Site 41 will remove low threat source material and return the site to its reasonably anticipated land use allowing industrial/commercial reuse of the site, which is consistent with current use and the overall cleanup strategy for NAS Whiting Field of restoring sites to support base operations.

Figure 1-1 Site 41 Location Map



1.5 STATUTORY DETERMINATIONS

The Selected Remedy is protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate to the remedial action, is cost-effective, and utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. The Selected Remedy does not satisfy the statutory preference for remedies that use treatment as a principal element to reduce the toxicity, mobility, or volume of hazardous substances, pollutants, and contaminants. The type and relatively low concentrations of soil contamination make treatment impracticable. In addition, no source materials constituting principal threats will be addressed within the scope of this action. USEPA generally expects to use containment rather than treatment to address contamination such as that at Site 41, which poses a relatively low long-term threat to human health and the environment.

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on site in excess of levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within 5 years of initiation of the remedial action and every 5 years thereafter to ensure that the remedy is, or will be, protective of human health and the environment. In addition, annual LUC compliance inspections will be conducted.

1.6 ROD DATA CERTIFICATION CHECKLIST

The locations in Section 2.0, Decision Summary, of the information required to be included in the ROD are summarized in Table 1-1. Additional information can be found in the Administrative Record file for NAS Whiting Field.

TABLE 1-1. ROD DATA CERTIFICATION CHECKLIST	
DATA	LOCATION IN ROD
Contaminants of concern (COCs) and their respective concentrations	Sections 2.5 and 2.7
Baseline risk represented by the COCs	Section 2.7
Cleanup levels established for COCs and the basis for these levels	Section 2.7 and 2.8
How source materials constituting principal threats are addressed	Section 2.11
Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the risk assessment	Section 2.6
Potential land and groundwater uses that will be available at the site as a result of the Selected Remedy	Section 2.12.3
Estimated capital, operating and maintenance (O&M), and total net present worth (NPW) costs; discount rate; and number of years over which the remedy costs are projected	Appendix B
Key factors that led to the selection of the remedy	Section 2.12.1

If contamination posing an unacceptable risk to human health or the environment is discovered after execution of this ROD and is shown to be a result of Navy activities, the Navy will undertake the necessary actions to ensure continued protection of human health and the environment.

1.7 AUTHORIZING SIGNATURES

Matt Coughlin
Captain, United States Navy
Commanding Officer
NAS Whiting Field, FL

Date

Franklin E. Hill, Director
Superfund Division
USEPA Region 4

Date

2.0 DECISION SUMMARY

2.1 SITE NAME, LOCATION, AND BRIEF DESCRIPTION

NAS Whiting Field, USEPA ID number FL2170023244, is located in Santa Rosa County, in Florida's northwestern coastal area, approximately 5.5 miles north of Milton and 25 miles northeast of Pensacola. The installation was constructed in the early 1940s and since has served as a Naval aviation training facility. NAS Whiting Field is approximately 3,842 acres in size and presently consists of two airfields (North and South Fields) separated by an industrial area. Current land use at NAS Whiting Field consists of various military housing, training, and support facilities for flight and academic training.

OU 27 - Site 41, Former Pesticide Storage Building 1485C, occupies approximately 23,000 square feet in the central industrial area of NAS Whiting Field (see Figure 2-1). Former Building 1485C was located within the Base Operating Services Compound northwest of the eastern termination of Yorktown Street and was used during an undetermined period of time for storage of ground maintenance equipment and limited amounts of pesticide compounds. The site has been in use since the early 1960s. The storage building caught fire in the late 1980s and was completely destroyed. Following the fire, cleanup activities at the site included the removal of all building materials, the concrete slab flooring, and an unknown quantity of soil. The depth of the removal and the disposal history of the excavated materials are unknown. Site 41 was initially designated Potential Source of Contamination (PSC) 1485C; therefore, many of the initial sample numbers and references reflect the original site nomenclature. The site is currently surrounded by several buildings, enclosed by a chain-link fence, and covered mostly by grass.

NAS Whiting Field is an active facility, and environmental investigations and remediation at the base are funded under Environmental Restoration, Navy (ER,N). The Navy is the lead agency for CERCLA activities at the facility, and USEPA and FDEP are support agencies.

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

Table 2-1 provides brief summaries of previous investigations conducted at Site 41. Results of these investigations indicated elevated concentrations of cPAHs, pesticides, and inorganics in soil at the site (Tetra Tech, 2010).

There have been no cited violations under federal or state environmental law or past enforcement actions pertaining to the cleanup of Site 41.

2.3 COMMUNITY PARTICIPATION

The Navy performs public participation activities in accordance with CERCLA and the NCP throughout the site cleanup process at NAS Whiting Field. The Navy has a comprehensive community relations program for NAS Whiting Field, and community relations activities are conducted in accordance with the NAS Whiting Field Community Relations Plan. These activities include regular technical and Restoration Advisory Board (RAB) meetings with local citizens and the establishment of an Information Repository at the local library for dissemination of information to the community.

The Navy organized a RAB in 1995 to review and discuss NAS Whiting Field environmental issues with local community officials and concerned citizens. The RAB consists of representatives of the Navy, USEPA, FDEP, and members of the community. The RAB has met frequently (usually once a year) since its inception. Site 41 investigation activities, results, and associated remedial decisions have been discussed at RAB meetings. The NAS Whiting Field Information Repository is located at the Santa Rosa County Library, Milton Branch, 5541 Alabama Street, Milton, Florida, 32570. Documents and other relevant information relied upon in the remedy selection process are available for public review in the Information Repository, which includes a copy of the Administrative Record. For additional information on the IR Program at NAS Whiting Field, contact: Mike Pattison, NAS Whiting Field, Public Works Department, 7183 Langley Street, Milton, Florida 32570-6159, (850) 623-7017 or e-mail at michael.pattison@navy.mil.

FIGURE 2-1 SITE 41 SITE LAYOUT

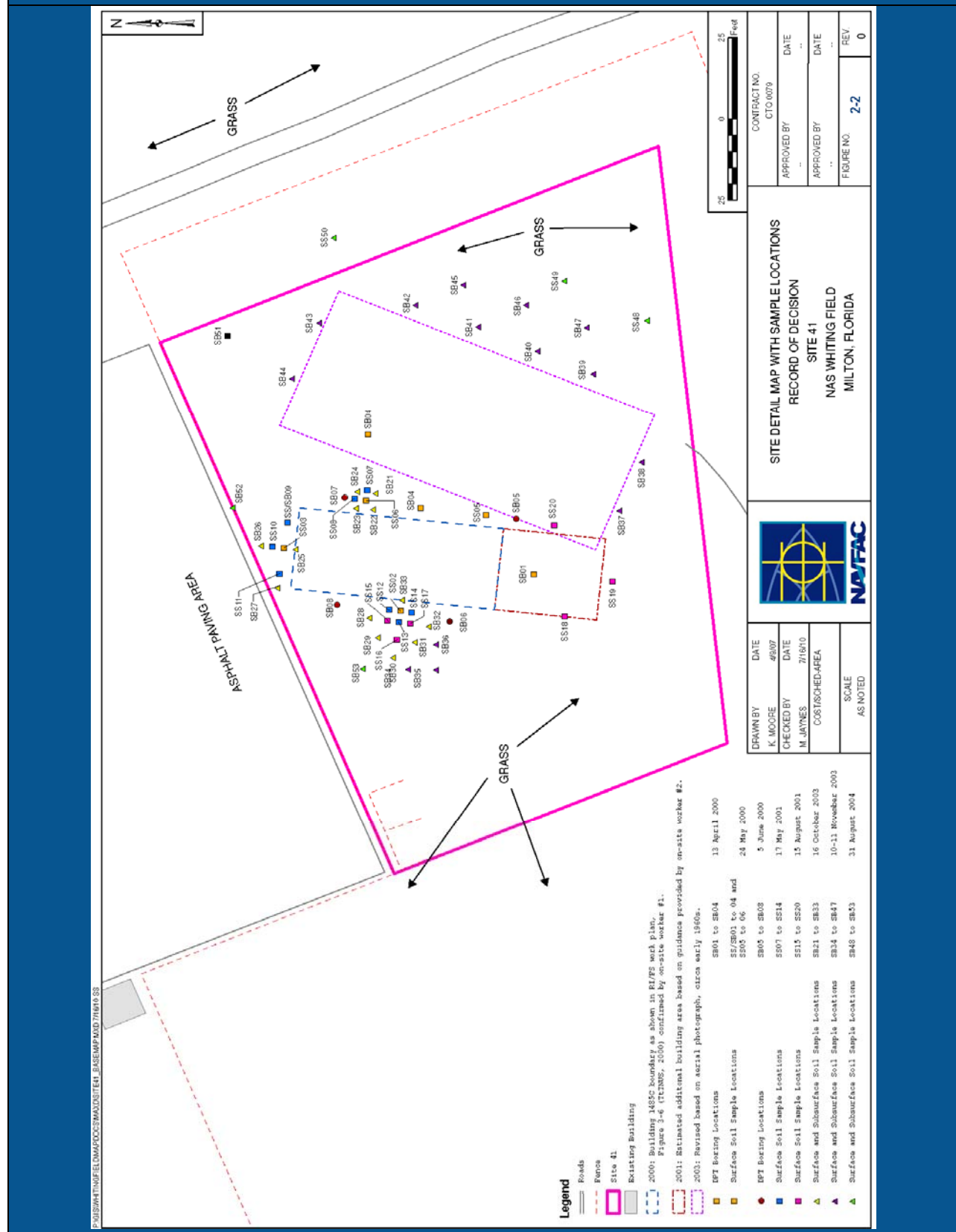


TABLE 2-1. PREVIOUS INVESTIGATIONS AND SITE DOCUMENTATION

INVESTIGATION	DATE	ACTIVITIES
Navy Risk Ranking	1996	In March 1996, Brown & Root Environmental Services, Inc., collected a single surface soil sample (0 to 1 feet deep) at the site to support the Navy's relative risk ranking. The soil sample was analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), TCL semivolatile organic compounds (SVOCs), TCL pesticides/polychlorinated biphenyls (PCBs), and Target Analyte List (TAL) metals. No organic compounds or inorganic analytes were detected in excess of regulatory limits.
Initial Remedial Investigation (RI)	2000	Four direct-push technology (DPT) borings were advanced to a depth of 20 feet below land surface (bls) on April 13, 2000, at locations projected to be near the boundaries of the former structure. Subsurface samples were collected from each boring at 5-foot intervals and screened on site with a flame ionization detector (FID). These subsurface soil samples did not exhibit a significantly elevated FID response, staining, or other indications that would warrant laboratory analysis. On May 24, 2000, six surface soil samples (0 to 1 foot bls) were collected near the originally indicated boundaries of the former structure. Sample locations were co-located with the DPT sample locations of April 13, 2000. These samples were analyzed using the Synthetic Precipitate Leaching Procedure (SPLP) for metals, pesticides, SVOCs (samples SS02, SS03, and SS06 only), and total recoverable petroleum hydrocarbons (TRPH).
Additional RI Sampling	2001	Only benzo(a)pyrene [B(a)P] and pesticides were detected in initial soil samples; therefore, analysis was limited to B(a)P and pesticides for the next group of samples (collected in 2001). These analytes were used as indicators of soil contamination at the site. Eight surface soil samples (0 to 1 foot bls) were collected on May 17, 2001, near where SVOCs or pesticides were detected previously. Based on additional information from on-site workers, the sampling area was extended approximately 20 feet to the south-southwest. On August 15, 2001, surface soil samples (0 to 1 foot bls) were collected from locations to further evaluate this additional area. Three surface soil samples were collected and analyzed for SVOCs and pesticides.
Further RI Sampling	2003/ 2004	Additional surface and subsurface soil samples were collected on October 16, 2003. B(a)P was used as an indicator chemical, and samples were analyzed for this compound only. Thirteen surface soil samples and 16 subsurface soil samples were collected during this sampling event. On November 10 and 11, 2003 Tetra Tech conducted sampling at 14 soil borings at locations south, east, and north of the former structure. Soil boring locations sampled during this event included SB34 through SB47. Three soil samples (from 0 to 1 foot bls, 1 to 2 feet bls, and 2 to 3 feet bls) were collected from each of these locations. All samples were analyzed for TCL, VOCs, SVOCs, pesticides/PCBs, TRPH, TAL inorganics, and cyanide. On August 31, 2004, additional samples were collected from 19 soil borings to the east, west, and north of the former structure. Sampling locations were selected to further delineate the horizontal and vertical extent of SVOC and/or pesticide soil contamination detected during previous sampling events. All samples collected during this event were analyzed for the SVOCs B(a)P and dibenzo(a,h)anthracene [D(a,h)A], and the pesticides aldrin, dieldrin, and heptachlor. Three subsurface soil samples were collected from each soil boring to depths of up to 6 feet bls. Also during this sampling event, soil samples were collected from each soil boring at locations SS48 through SS53. A surface soil and two subsurface soil samples were collected at each location and analyzed for the five compounds indicated above.
RI Report and Feasibility Study (FS)	2010	Based on the nature and extent of soil contamination determined during the RI, an FS was conducted to develop and evaluate soil remedial alternatives. Additional soil delineation will be required prior to implementation of the remedy.

In accordance with Sections 113 and 117 of CERCLA, the Navy provided a public comment period from January 10 to February 9, 2011, for the proposed remedial action described in the Proposed Plan (Tetra Tech, 2011b) for Site 41. Public notice of the meeting and availability of documents were published in the Pensacola News Journal and Santa Rosa Press Gazette on January 9 and 10, 2011, respectively.

2.4 SCOPE AND ROLE OF OPERABLE UNIT

Site 41 is part of a comprehensive environmental investigation and cleanup program currently being performed at NAS Whiting Field under CERCLA authority pursuant to the Federal Facility Agreement (FFA) dated March 9, 2009 (effective July 10, 2009). IR Program cleanup activities are being performed under CERCLA, except at those sites subject to the FDEP Underground Storage Tank (UST) Program. As discussed in Section 1.4, 27 IR sites have been identified at NAS Whiting Field. USEPA, Navy, and FDEP staff-level project managers agreed that no further investigation, i.e., no RI/FS, was warranted for three sites including Sites 8, 36, and 37. Sites 4 and 7 were deferred to the FDEP UST Program. A No Further Action ROD for soil at Site 31 was signed in September 2002, for soil at Sites 3 and 6 in September 2004, for soil at Sites 5, 9, 12, 29, and 38 in September 2005, for soil at Site 14 in September 2006, and for soil at Site 2 in October 2008. RODs implementing LUCs as the remedial action were signed for soil at Site 1 in September 1999, Sites 30, 32, and 33 in September 2004, Sites 13, 17, 18, and 35 in September 2006, Sites 10 and 11 in September 2007, and Site 16 in October 2008. The Site Management Plan (SMP) for NAS Whiting Field further details the schedule for CERCLA activities and is updated annually.

2.5 SITE CHARACTERISTICS

Figure 2-2 presents the Site 41 conceptual site model (CSM), which identifies potential contaminant sources, contaminant release mechanisms, transport routes, and receptors under current and future land use scenarios. The source of contamination at Site 41 is likely related to pesticide and equipment storage, and potential contaminant release and transport mechanisms include precipitation infiltration and migration to subsurface soil and runoff and erosion of contaminated soil via wind and/or stormwater runoff. Because the site surface is relatively level and mostly covered with grass, erosion via wind and runoff are considered minimal. Human health and ecological receptors are discussed in Section 2.7.1 and 2.7.2, respectively.

2.5.1 Physical Characteristics

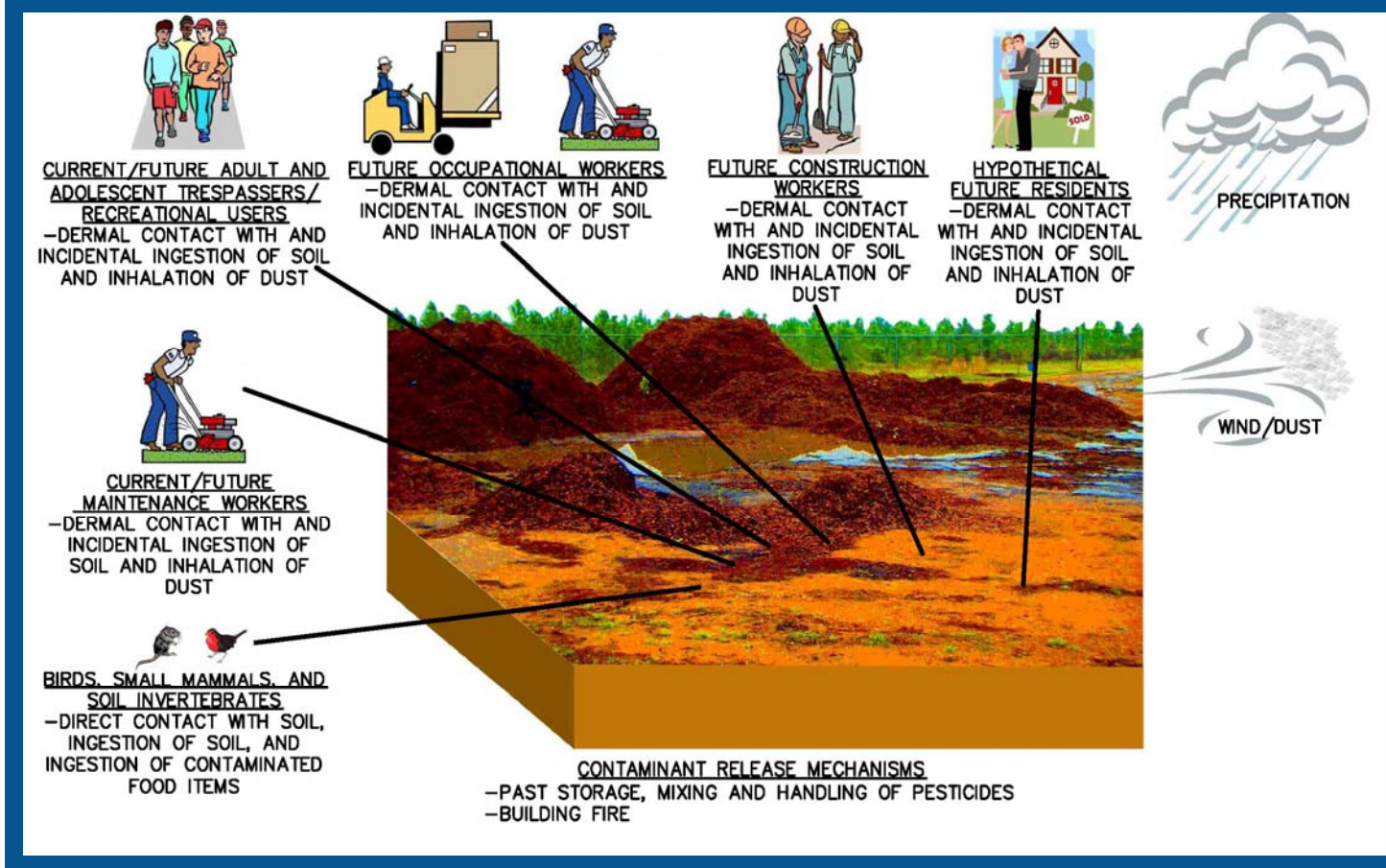
The surface of Site 41 is relatively level and is predominantly covered by grass, with some gravel at the southern edge. The soils at Site 41 include three lithologic layers to a depth of 20 feet bls. The first layer (0 to 7 feet bls) is a clayey sand, the second layer (7 to 15 feet bls) is a sandy clay, and the third layer (15 to 20 feet bls) is a clayey sand. The soil is characterized as Troupe loamy sand by the United States Department of Agriculture (USDA) classification system.

2.5.2 Nature and Extent and Fate and Transport of Contamination

The RI concluded that the release of contaminants at Site 41 appears to have resulted from storage and disposal of pesticides used for maintenance of the base grounds and other undocumented activities at the site. The source and nature of materials and the time of disposal are not precisely known in terms of timing, incident, or process.

During the RI, several iterative sampling events were conducted from 2000 to 2004 during which a total of 53 surface soil and 67 subsurface soil samples were collected and analyzed for various parameters. Analytical results were compared to FDEP SCTLs (FDEP, 2005), NAS Whiting Field background screening values for inorganics only, and USEPA Regional SSLs (USEPA, 2008) to determine if contaminants in soil samples exceeded regulatory criteria.

FIGURE 2-2. CONCEPTUAL SITE MODEL



Constituents detected in surface and subsurface soil samples from Site 41 included PAHs, pesticides, inorganics, cyanide, and TRPH. The conclusions of the Site 41 RI were as follows:

- PAHs [benzo(a)anthracene, B(a)P, benzo(b)fluoranthene, D(a,h)A, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene] were detected in surface soil at Site 41 in several locations, including SB47, SS07, and SB41.
- Large areas of pesticide [4,4-dichlorodiphenyldichlorethane (DDD), 4,4-dichlorodiphenyl-dichloroethylene (DDE), 4,4-dichlorodiphenyltrichloroethane (DDT), and dieldrin] exceedances are present in surface soil in the southeastern and northwestern portions of Site 41.
- Two areas of inorganic (chromium, lead, and zinc) exceedances were defined, south and southwest of SB37 and also northwest, north, and northeast of SB43 and SB44.
- Lead was also detected in the SPLP leachate from surface soil samples SS01, SS04, SS05, and SS06 at concentrations exceeding primary criteria.
- SVOC exceedances at SB43 were delineated in all directions except to the south where the former building was located. A second area associated with locations SB31 and SB35 is well defined in all directions except southwest of SB35.
- Pesticide (4,4-DDE and dieldrin) exceedances at SB37 have not been delineated to the south or southwest. Exceedances associated with SB41 and SB43 have been laterally delineated.

Surface and subsurface soil exceedances of residential and industrial screening criteria are presented on Figure 2-3. Estimated volumes of contaminated soil generated during the FS for residential and industrial scenarios were 836 and 88 cubic yards, respectively (Tetra Tech, 2011a).

Pesticides such as dieldrin have low mobility but are highly persistent contaminants that, when released to the environment, generally adsorb to the soil matrix and remain bound to particulate matter. PAHs are also considered to be persistent in the environment and are much more likely to bind to soil than to go into solution. PAHs are subject to degradation via aerobic bacteria but may be relatively persistent in the absence of microbial population or macronutrients such as phosphorus and nitrogen. Because of their persistence and tendency to adhere to soil particles, both PAHs and pesticides tend to migrate from source areas via bulk movement processes (e.g., surface runoff and wind erosion) and, if leaching from soil to groundwater occurs, it usually results in transportation over relatively short distances.

2.6 CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

NAS Whiting Field is an active military facility and is expected to remain active for the foreseeable future. Current land use at NAS Whiting Field consists of various aviation-related military training, housing, and support facilities and large industrial complexes for major repairs and refurbishment of aircraft. NAS Whiting Field provides the support facilities for flight and academic training. Other land uses on base include equipment and materials storage, maintenance areas, and recreational facilities for military personnel.

Land surrounding NAS Whiting Field consists primarily of agricultural land to the northwest, residential and forested areas to the south and southwest, and forested areas along the remaining boundaries. Elevations at NAS Whiting Field, located on an upland area, range from 50 to 190 feet above sea level. The facility is bounded by the following low-lying receiving waters: Clear Creek to the west and south and Big Coldwater Creek to the east. These two streams are tributaries of the Blackwater River, which discharges to the estuarine waters of the East Bay of the Escambia Bay coastal system. Both Clear Creek and Big Coldwater Creek are classified by the FDEP as Class III Waters Recreation-Propagation and Management of Fish and Wildlife. Blackwater River is classified as an Outstanding Florida Water. Outstanding Waters are considered to be of exceptional recreational and ecological significance.

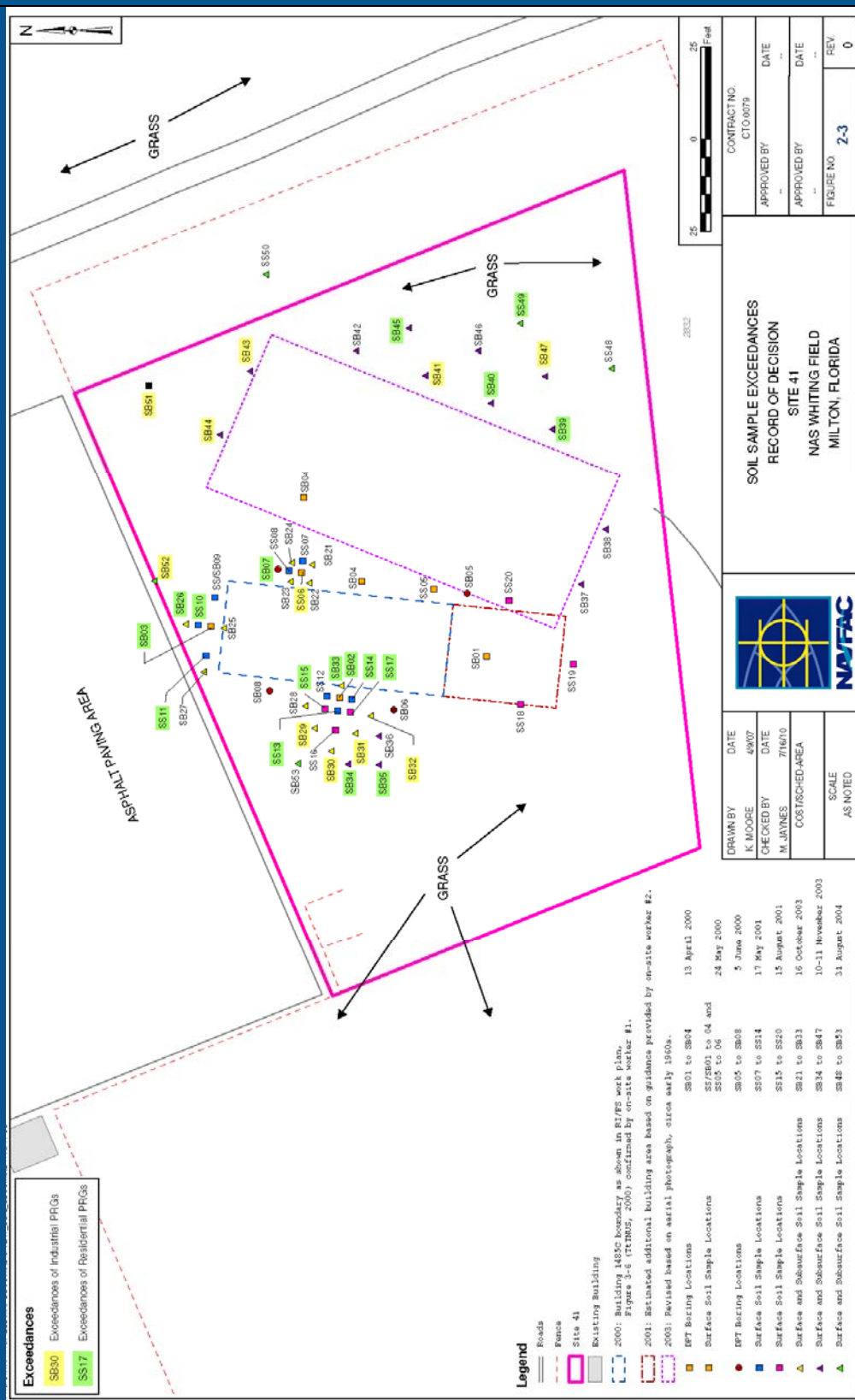
On-site wildlife may temporarily use Site 41, but due to lack of suitable cover, wildlife habitat is limited and use is assumed to be infrequent. Industrial/commercial-type use of the site is expected to continue for the foreseeable future. The NAS Whiting Field Master Plan identifies the planned future use of the site as an industrial lay-down area, indicating that no future development or construction activities are planned for the site. If future land use at Site 41 differs from the reasonably anticipated land use, the Navy will reassess risks appropriate to the future use with input from USEPA and FDEP.

Three potable water wells (North, West, and South wells) are located on NAS Whiting Field and provide the main source of potable water for the base. The water supply wells are completed at depths ranging from 230 to 263 feet bls and extract groundwater from the sand and gravel aquifer. The nearest potable water well (the North well) is located approximately 800 feet west-northwest of Site 41. No surface water bodies are located within or near the site boundaries.

2.7 SUMMARY OF SITE RISKS

The baseline risk assessment estimates what risks the site poses if no action was taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. A human health risk assessment (HHRA) and ecological risk assessment (ERA) were conducted as part of the Site 41 RI.

FIGURE 2-3. SOIL SAMPLE EXCEEDANCES



2.7.1 Summary of Human Health Risk

The quantitative HHRA was conducted using chemical concentrations detected in surface and subsurface soil samples collected at Site 41 and using both USEPA and State of Florida regulations and guidelines for HHRA. Key steps in the risk assessment process included identification of contaminants of potential concern (COPCs), exposure assessment, toxicity assessment, and risk characterization. Tables summarizing data used in the HHRA and associated results are presented in Appendix C.

Identification of COPCs

Tables D-1 through D-10 from the Site 41 RI Report (included in Appendix C) present exposure point concentrations (EPCs) for the COPCs identified in surface and subsurface soil at Site 41. EPCs are the concentrations used in the risk assessment to estimate exposure and risk from each COC. Based on the statistical distributions of the data and the results of preliminary calculations, maximum detected concentrations or 95-percent upper confidence limits (UCLs) on the mean were used as the EPCs for Site 41 COPCs.

COPCs were selected for quantitative evaluation based on comparisons of surface and subsurface soil concentrations to FDEP direct contact risk-based SCTLs. Constituents identified as potential threats to human health based on this initial screening (cPAHs, dieldrin, and chromium for surface soil and cPAHs, 4,4'-DDT, aldrin, and dieldrin for subsurface soil) were identified as COPCs and evaluated in the baseline risk assessment.

Exposure Assessment

During the exposure assessment using USEPA methodology (USEPA, 1988), current and potential future exposure pathways through which people might come into contact with the COPCs identified in the previous step were evaluated. The results of the exposure assessment for Site 41 were used to refine the CSM (Figure 2-2). Exposures to soil contamination via dermal contact (skin exposure), incidental ingestion (swallowing small amounts of soil), and inhalation (breathing) are the only current exposure pathways, and current receptors include site maintenance (e.g., groundskeeping) workers and adult and adolescent recreational users/trespassers. In addition to current receptors, potential future receptors include construction/excavation workers, occupational workers, and hypothetical child and adult residents. Potential soil exposure routes for these receptors also include incidental ingestion, dermal contact, and/or inhalation. The future residential scenario was quantitatively evaluated in the risk assessment for decision-making purposes, although this scenario is unlikely (i.e., is not the reasonably anticipated land use) at Site 41. Current and hypothetical future exposure pathways evaluated during the Site 41 risk assessment are summarized in Table 2-2.

Toxicity Assessment

The toxicity assessment involves identifying the types of adverse health effects caused by exposure to site COCs and determining the relationship between the magnitude of exposure and the severity of adverse effects (i.e., dose-response relationship) for each COC. Based on the quantitative dose-response relationships determined, toxicity values for both cancer (cancer slope factor [CSF]) and non-cancer (reference dose [RfD]) effects are generally used to estimate the potential for adverse effects. The SCTLs presented in Tables D-1 through D-10 based in Appendix C are risk-based values derived to represent direct contact risks of 1×10^{-6} for carcinogens and hazard quotients (HQs) of 1.0 for non-carcinogens. Potential health effects are contaminant specific and may include an increased risk of developing cancer or non-cancer effects such as changes in normal functions of organs or organ systems. Some contaminants can cause both cancer and non-cancer effects. Toxicity data used to derive FDEP SCTLs indicate potential cancer risk associated with cPAHs and cancer risks and non-cancer hazards associated with 4,4'-DDT, aldrin, dieldrin and chromium. The available toxicity data indicate that 4,4'-DDT, aldrin, and dieldrin primarily affect the liver, and chromium primarily affects the respiratory system.

TABLE 2-2. RECEPTORS AND EXPOSURE ROUTES EVALUATED IN HHRA

RECEPTOR	EXPOSURE ROUTES
Adult and Adolescent Trespassers/Recreational Users (current and future land use)	Soil dermal contact (surface soil) Soil ingestion (surface soil) Inhalation of air/dust/emissions (surface soil)
Maintenance Workers (current and future land use)	Soil dermal contact (surface soil) Soil ingestion (surface soil) Inhalation of air/dust/emissions (surface soil)
Construction Workers (future land use)	Soil dermal contact (surface and subsurface soil) Soil ingestion (surface and subsurface soil) Inhalation of air/dust/emissions (surface and subsurface soil)
Occupational Workers (future land use)	Soil dermal contact (surface soil) ⁽¹⁾ Soil ingestion (surface soil) ⁽¹⁾ Inhalation of air/dust/emissions (surface soil) ⁽¹⁾
Residents (Adults/Children) (hypothetical future land use)	Soil dermal contact (surface soil) ⁽¹⁾ Soil ingestion (surface soil) ⁽¹⁾ Inhalation of air/dust/emissions (surface soil) ⁽¹⁾

1 - Occupational workers and residents were also evaluated for exposure to COPCs in subsurface soil to account for the possibility that subsurface soil could be brought to the surface in future excavation projects

Risk Characterization

During the risk characterization, the outputs of the exposure and toxicity assessments are combined to characterize the baseline risk (cancer risks and non-cancer hazards) at the site if no action was taken to address the contamination. Potential cancer risks and non-cancer hazards are generally calculated based on reasonable maximum exposure (RME) and central tendency exposure (CTE) assumptions. The RME scenario assumes the maximum level of human exposure that could reasonably be expected to occur, and the CTE scenario assumes a median or average level of human exposure.

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the carcinogen. These calculated risks are probabilities that are usually expressed in scientific notation (e.g., 1×10^{-6}). An excess lifetime cancer risk of 1×10^{-6} under an RME scenario indicates that an individual experiencing the reasonable maximum exposure estimate has a 1 in 1 million chance of developing cancer as a result of site-related exposure. USEPA's generally acceptable risk range for site-related exposures is 1 in 10,000 to 1 in 1 million (1×10^{-4} to 1×10^{-6}) and FDEP has a target risk of 1 in 1 million (1×10^{-6}).

Risk characterization results for Site 41 are presented in Tables D-1 through D-10 in Appendix C. Cancer risks were estimated using a risk ratio approach by dividing EPCs by the risk-based SCTLs and multiplying by 1×10^{-6} because SCTLs for carcinogens are based on risks of 1×10^{-6} . Risks to hypothetical future recreational users at Site 41 were evaluated using site-specific SCTLs developed in accordance with applicable guidelines. Total risk estimates for Site 41 ranged from 8.0×10^{-7} for adolescent recreational users exposed to surface soil to 1.0×10^{-5} for hypothetical future residents exposed to surface soil. These risk levels indicate that if no cleanup action was taken, the increased probabilities of developing cancer as a result of site-related exposure would range from approximately 1 in 100,000 to 8 in 10,000,000.

The potential for non-carcinogenic effects is generally evaluated by comparing an exposure level over a specified time period (e.g., a lifetime) to an RfD derived for a similar exposure period. An RfD represents a level to which an individual may be exposed that is not expected to cause any deleterious effect. The

ratio of exposure to toxicity is called an HQ. An HQ less than 1 indicates that a receptor's dose of a single contaminant is less than the RfD and that toxic non-carcinogenic effects from that chemical are unlikely. For Site 41, non-cancer hazards were estimated by dividing EPCs by the risk-based SCTLs (based on HQs of 1.0). Estimated non-cancer hazards for all surface and subsurface COPCs were less than 1 (acceptable).

Cancer risk estimates (incremental lifetime cancer risks [ILCRs]) developed for maintenance workers and adult and adolescent recreational users exposed to COPCs in surface soil and for construction workers exposed to COPCs in subsurface soil were less than 1×10^{-6} . Total ILCRs for construction workers and lifelong recreational users exposed to surface soil and full-time commercial/industrial workers and hypothetical future residents exposed to surface and subsurface soil were within the USEPA target risk range of 1×10^{-4} to 1×10^{-6} but were greater than the FDEP target risk of 1×10^{-6} . The primary risk drivers were cPAHs and dieldrin in surface soil and cPAHs, aldrin (residential scenario only), and dieldrin in subsurface soil. Non-cancer hazard estimates (HQs) for all receptors evaluated were less than unity (1.0). Consequently, adverse non-carcinogenic health effects are not anticipated under the conditions established in the exposure assessment.

2.7.2 Summary of Ecological Risk

A screening-level ERA, consisting of Steps 1 through 3A of the Navy's ERA process, was conducted at Site 41. Complete exposure pathways and routes of entry into biota at Site 41 include direct contact with soil (soil invertebrates and terrestrial vegetation), ingestion of soil (soil invertebrates, birds, and small mammals), and ingestion of contaminated food items (birds and small mammals) (see Figure 2-2). Because the site is largely covered by vegetation, airborne transport of dust was considered a negligible pathway for terrestrial animals and aerial deposition was considered a negligible pathway for plants and animals. Ecological receptors are not directly exposed to contaminants in groundwater at the site, and surface water is not present at or near Site 41. Contaminant migration pathways applicable at this site include erosion and infiltration. Because the site is essentially covered with vegetation, wind erosion is not a significant migration pathway. However, if surface soil is disturbed through activities such as excavation, soils could serve as a source for airborne transport of contaminants, and soil contaminants could then be transported to downwind locations. Soil erosion due to storm water runoff is minimal at Site 41 due to the essentially level terrain and vegetative cover. No constituents were retained as COPCs for risk to plants, soil invertebrates, or wildlife at Site 41. Based on these results, the Navy and USEPA, in consultation the FDEP, determined no action to address ecological receptors was warranted.

2.7.3 Basis for Action

The data demonstrate that the soil at Site 41 is characterized by both lateral and vertical contamination by cPAHs, dieldrin, 4-4'-DDT, and TRPH. Of these contaminants, cPAHs and dieldrin exceed Florida's industrial SCTLs in Chapter 62-777, Florida Administrative Code (F.A.C.), Table II, and all four contaminants exceed the residential SCTLs up to two orders of magnitude. Given the locations, types, and levels of contaminants discovered, and other general circumstances found at Site 41, it is the Navy's considered discretionary judgment that some form of remedial action is warranted at this site.

Implementing a soil removal action in conjunction with LUCs prohibiting residential land use at Site 41, following additional soil delineation, will allow the Navy to properly and effectively manage future land use at the site and minimize threats to human health or the environment.

2.8 REMEDIAL ACTION OBJECTIVE

Remedial Action Objectives (RAOs) are medium-specific goals that define the objectives for conducting remedial actions, if needed, to protect human health and the environment. RAOs specify the COCs, potential exposure routes and receptors, and acceptable concentrations (i.e., cleanup levels) for a site

and provide a general description of what the cleanup will accomplish. RAOs typically serve as the design basis for the remedial alternatives described in Section 2.9. The RAO for Site 41 is as follows:

- To protect human health from carcinogenic risks associated with incidental ingestion of, inhalation of, and dermal contact with soil containing cPAHs and dieldrin at concentrations exceeding Florida's commercial/industrial SCTLs.

Site 41 cleanup goals (CGs), as established in the FS, for the COCs are FDEP SCTLs, as presented in Table 2-3.

TABLE 2-3. SOIL CLEANUP GOALS		
COC	RESIDENTIAL CG*	INDUSTRIAL CG
cPAHs	0.100	0.700
Dieldrin	0.06	0.30

Concentrations in mg/kg

*Applicable under Alternative S41-3

Removal of soil at Site 41 with COC concentrations greater than industrial CGs will eliminate unacceptable human health risks for future industrial and construction workers and current lifelong recreational users (because site-specific recreational SCTLs are greater than industrial SCTLs; see Appendix C), and prevention of exposure to soil with COC concentrations greater than residential SCTLs will eliminate unacceptable human health risks for hypothetical future residents.

2.9 DESCRIPTION OF REMEDIAL ALTERNATIVES

To address potential unacceptable human health risks associated with soil at Site 41, a preliminary technology screening evaluation, including the following steps, was conducted in the FS (Tetra Tech, 2011a). The general response actions (GRAs) are presented in Table 2-4. Soil remedial technologies and process options excluded from further analysis included infiltration barriers under the containment GRA because reduction of infiltration is not required to meet RAOs, and in-situ treatment including thermal, physical/chemical, and biological technologies because they were not applicable to all site contaminants or conditions or because they would interfere with future site uses.

TABLE 2-4. GENERAL RESPONSE ACTIONS		
GENERAL RESPONSE ACTION	TECHNOLOGY	PROCESS OPTIONS
No Action	None	Not applicable
Limited Action	LUCs	Administrative controls: deeds and site use restrictions
Removal	Excavation	Excavation
Disposal	Landfill	Off-base landfilling

The technologies and process options retained after detailed screening were assembled into three alternatives. Consistent with the NCP, a no action alternative was evaluated for soil as a baseline for comparison with other alternatives during the comparative analyses. Three remedial alternatives for soil (no action, excavation to meet industrial SCTLs with LUCs, and excavation to meet residential SCTLs) were retained for a detailed comparative analysis in accordance with the NCP. Table 2-5 describes the major components and provides estimated costs for the soil remedial alternatives identified for Site 41.

TABLE 2-5. SOIL REMEDIAL ALTERNATIVES EVALUATED

ALTERNATIVE	COMPONENTS	DETAILS	COST
S41-1: No Action <i>No action to address contaminated soil and no restrictions on activities.</i>	None	No action	No cost
S41-2: Excavation to Meet Industrial SCTLs and Off-Site Disposal with LUCs <i>Excavation and off-site disposal of all soil with COC concentrations exceeding industrial SCTLs and LUCs</i>	Excavation and off-site disposal of soil	Excavation and off-site disposal of approximately 88 cubic yards of soil; collection of confirmation samples from the sidewalls and bottoms of excavated areas; backfilling of excavated areas with clean backfill material, covering with topsoil, and reseeding	Cost Capital: \$80,000 30-Year NPW of O&M: \$26,000 30-Year NPW: 106,000 Discount rate: 6% Time frame: 1 month
	LUCs	LUCs to restrict future site uses to non-residential activities and to prohibit uncontrolled soil excavation at the site	
S41-3: Excavation to Meet Residential SCTLs and Off-Site Disposal <i>Excavation and off-site disposal of all soil with COC concentrations exceeding residential SCTLs</i>	Excavation and off-site disposal of soil	Excavation and off-site disposal of approximately 847 cubic yards of soil; collection of confirmation samples from the sidewalls and bottoms of excavated areas; backfilling of excavated areas with clean backfill material, covering with topsoil, and reseeding	Cost Capital: \$239,000 30-Year NPW of O&M: \$0 30-Year NPW: \$239,000 Discount rate: 6% Time frame: 3 months

2.10 COMPARATIVE ANALYSIS OF ALTERNATIVES

Table 2-6 and text in this section summarize the comparison of the remedial alternatives with respect to the nine CERCLA evaluation criteria outlined in the NCP at 40 Code of Federal Regulations (CFR) 300.430(e)(9)(iii) and categorized as threshold, primary balancing, and modifying criteria. Further information on the detailed comparison of remedial alternatives is presented in the Site 41 FS (Tetra Tech, 2011a).

Threshold Criteria

Overall Protection of Human Health and the Environment. The no action alternative would not achieve the RAOs and therefore would not protect human health and the environment. This alternative will not be considered further in this ROD.

Although soil removal to achieve residential SCTLs, as contemplated under Alternative S41-3, would be the most protective of human health because it would permanently remove all unacceptable risks from exposure to soil COCs, this alternative does not factor in the current and reasonably anticipated future land use (industrial) as is allowed by USEPA guidance (USEPA, 1991). Soil excavation to meet industrial SCTLs would be consistent with current and future use, and when combined with the appropriate LUCs to preclude the possibility of residential uses, would be adequately protective of human health and the environment.

Compliance with ARARs. Applicable or Relevant and Appropriate Requirements (ARARs) include any federal or state standards, requirements, criteria, or limitations determined to be either legally applicable or relevant and appropriate to the site or remedial action. Both excavation alternatives evaluated would meet all chemical- and action-specific ARARs to the same general degree. No location-specific ARARs exist for this site.

TABLE 2-6. SUMMARY OF COMPARATIVE ANALYSIS OF SOIL ALTERNATIVES

CERCLA Criterion	S41-1: No Action	S41-2: Excavation and Off-Site Disposal to Meet Industrial SCTLs with LUCs	S41-3: Excavation and Off-Site Disposal to Meet Residential SCTLs
Overall Protection of Human Health and the Environment	○	●	●
Compliance With ARARs and TBCs	○	●	●
Long-Term Effectiveness and Permanence	○	●	●
Reduction of Toxicity, Mobility, and Volume	NA	○	○
Short-Term Effectiveness	○	●	●
Implementability	NA	●	●
Capital Cost	\$0	\$80,000	\$239,000
NPW of O&M	\$0	\$26,000	\$0
NPW	\$0	\$106,000	\$239,000
State Acceptance	○	●	●
Community Acceptance	○	●	●

● - High ● - Medium ○ - Low

Primary Balancing Criteria

Long-Term Effectiveness and Permanence. Soil excavation to achieve residential SCTLs would have the most long-term effectiveness and permanence because all contaminated soil with COC concentrations greater than residential SCTLs would be removed from the site. Excavation to meet industrial SCTLs would have less long-term effectiveness and permanence than residential excavation because contamination would remain on site, and LUCs would be required to provide continued protectiveness.

Reduction in Toxicity, Mobility, or Volume Through Treatment. Neither Alternative S41-2 nor S41-3 would utilize treatment to reduce the toxicity, mobility, or volume of hazardous substances. Because of the type of contamination detected at Site 41 and its relatively low long-term risk based on the current and reasonably anticipated future site use, soil treatment was deemed impracticable and would not be cost effective. In addition, no source constituting principal threats will be addressed within the scope of either alternative.

Short-Term Effectiveness. Because of the excavation and off-base transportation of a larger quantity of soil, which would involve a greater opportunity for exposure of remediation workers and the community to contaminated soil, Alternative S41-3 would pose greater short-term risk than S41-2. Under both alternatives, the use of proper personal protective equipment (PPE), monitoring equipment, and observance of Occupational Safety and Health Administration (OSHA) guidelines would address the worker exposure concerns. Potential environmental effects such as dust, storm water erosion, and noise abatement could be managed through control measures implemented during site activities. The industrial

excavation alternative would include LUCs and would have additional short-term risks associated with the need to periodically inspect the site.

Implementability. Both S41-2 and S41-3 would be relatively easy to implement because resources, equipment, and materials for soil excavation (basic earth-moving equipment) are readily available. Except for procurement of the appropriate disposal facility and arrangement for transportation, these alternatives would not require an extended planning phase or design. Delineation to determine the limits of excavation area would need to be conducted through sampling under each alternative. The industrial excavation alternative, which would include LUCs, would involve additional administrative aspects (inspection and maintenance) but would still be readily implementable.

Cost. The estimated present-worth for excavation to achieve industrial SCTLs and LUCs (Alternative S41-2) is \$106,000, and the estimated present-worth cost for excavation to achieve residential SCTLs (Alternative S41-3) is \$239,000.

Modifying Criteria

State Acceptance. State involvement has been solicited throughout the CERCLA process for Site 41. FDEP, as the designated state support agency in Florida, concurs with the Selected Remedy.

Community Acceptance. No written questions were received during the formal public comment period (January 10 to February 9, 2011) for the Proposed Plan (Tetra Tech, 2011b). No public meeting was requested and therefore, no meeting was held.

2.11 PRINCIPAL THREAT WASTES

The NCP at 40 CFR 300.430(a)(1)(iii)(A) establishes an expectation that treatment will be used to address the principal threats posed by a site wherever practicable. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or that would present a significant risk to human health or the environment should exposure occur. A source material is a material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to groundwater, surface water, or air, or acts as a source for direct exposure. The residual soil contamination at Site 41 is not highly toxic or highly mobile; therefore, principal threat wastes are not present at the site.

2.12 SELECTED REMEDY

2.12.1 Rationale for Selected Remedy

The Selected Remedy for Site 41 at NAS Whiting Field is S41-2, Soil Excavation and Off-Site Disposal to meet FDEP Industrial Cleanup Criteria and LUCs, which was selected because it provides the best balance of tradeoffs with respect to the nine CERCLA evaluation criteria and will allow for continued industrial use of the property. The remedy will meet the RAO by excavating soil with COC concentrations greater than FDEP industrial SCTLs and by implementing LUCs to restrict future site uses to industrial activities and to prohibit uncontrolled soil excavation.

The principal factors in the selection of this remedy included the following:

- The remedy is consistent with the reasonably anticipated future industrial use of the site and will allow continued use of the area for equipment storage.
- The remedy achieves protection at a lower cost less than full-scale removal to achieve unlimited use and unrestricted exposure (\$106,000 compared to \$239,000).

2.12.2 Description of Selected Remedy

The Selected Remedy includes two major components: (1) excavation and off-site disposal of contaminated soil to meet FDEP industrial SCTLs; and (2) LUCs to restrict site use to non-residential activities only and to prohibit soil excavation or disturbance.

Soil will be excavated from an area of approximately 1,028 square feet to an estimated depth of 2 feet, for a total of approximately 88 cubic yards of soil (see Figure 2-4). The final excavation limits will be determined based on sampling conducted prior to or during preparation of the Remedial Design (RD). Confirmatory samples will be collected from the sidewalls and bottoms of the excavated areas to verify that industrial SCTLs are met. TCLP sampling will be conducted to verify disposal requirements. For costing purposes, it was assumed that all of the soil would meet TCLP limits and not require treatment prior to disposal at a RCRA Subtitle D (non-hazardous) facility. Approximately 88 cubic yards of excavated void will be filled with clean backfill, covered with top soil, and seeded with grass.

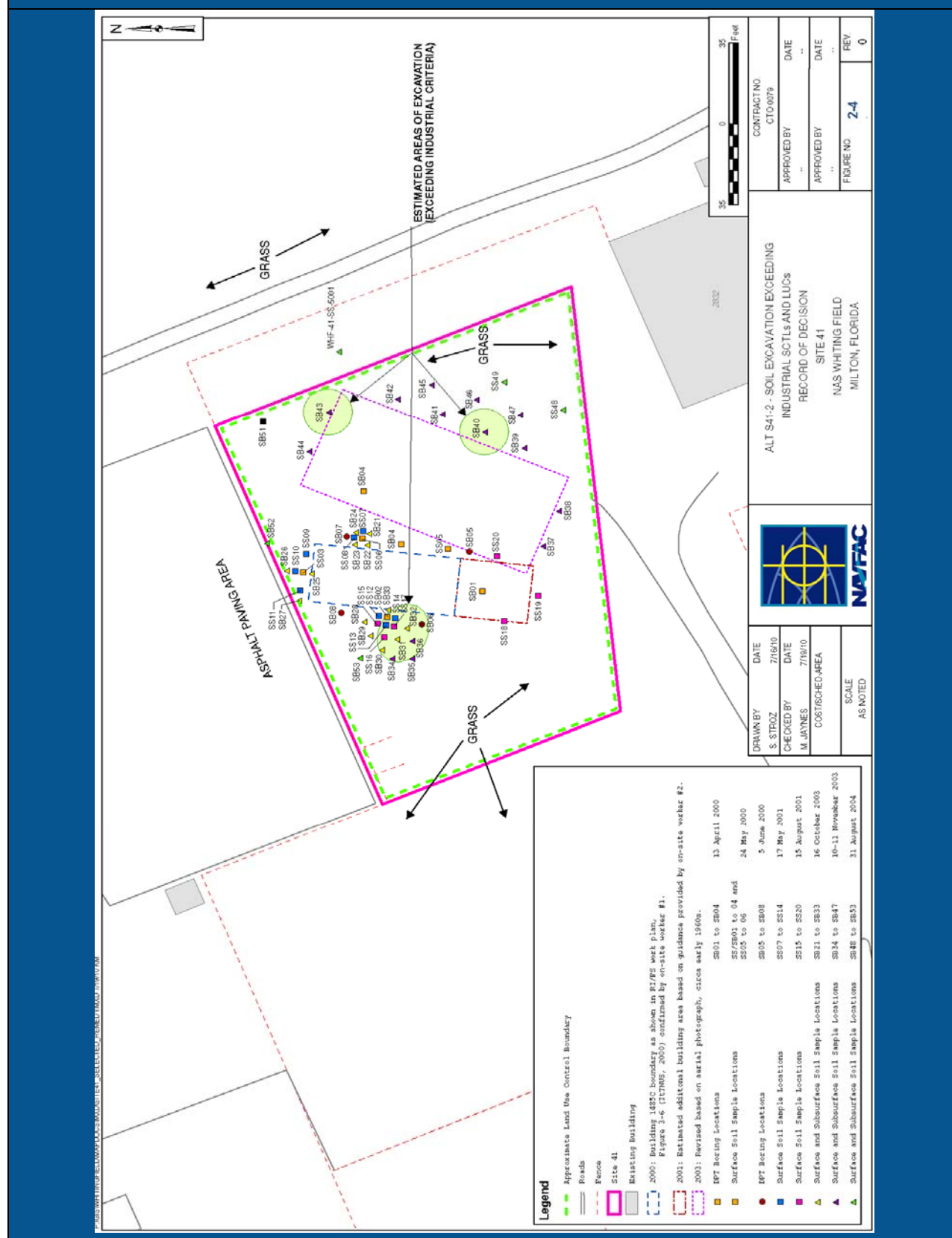
LUCs will be implemented within the Site 41 boundaries (see Figure 2-4) to limit use of the property and to prohibit soil excavation and disturbance. Consistent with the RAO developed for the site, the specific performance objectives for the LUCs to be implemented at Site 41 are as follows:

- To prohibit residential or residential-like reuse of the site unless prior written approval is obtained from the USEPA and FDEP. Prohibited residential or residential-like uses shall include, but are not limited to, any form of housing, child-care facilities, pre-schools, elementary schools, secondary schools, playgrounds, convalescent, or nursing care facilities.
- To prohibit the excavation and uncontrolled disturbance of surface and subsurface soil at the site unless prior written approval is obtained from the USEPA and FDEP.
- To maintain the integrity of any existing or future monitoring or remediation system(s) unless prior written approval is obtained from the USEPA and FDEP.

The following generally describes those LUCs that will be implemented at Site 41 to achieve the aforementioned LUC performance objectives:

- Incorporation of the LUC boundaries and all prohibited land uses into the Base Master Plan. This LUC will prohibit residential or residential-like reuse of the site and excavation and uncontrolled disturbance of surface and subsurface soil at the site unless prior written approval is obtained from the USEPA and FDEP.
- Utilization of the installation Excavation Permitting process to require review/approval by the NAS Whiting Field Public Works Department and implementation of appropriate worker protection practices before any intrusive activities are performed at the site. This LUC will prohibit the excavation and uncontrolled disturbance of surface and subsurface soil at the site and maintain the integrity of any existing or future monitoring or remediation system(s) unless prior written approval is obtained from the USEPA and FDEP.
- Placement of appropriate notices and restrictions in any deed of conveyance or lease affecting the site in the event the property is conveyed or leased to a third party. This LUC will prohibit residential or residential-like reuse of the site unless prior written approval is obtained from the USEPA and FDEP.
- Posting of signs at the site advising that any excavation activity must be authorized in advance by the base environmental department. The size, location, and content of the signs will be specified in the LUC RD. This LUC will prohibit the excavation and uncontrolled disturbance of surface and subsurface soil at the site and maintain the integrity of any existing or future monitoring or remediation system(s) unless prior written approval is obtained from the USEPA and FDEP.

FIGURE 2-4. SUMMARY OF SELECTED REMEDY



LUCs will be implemented and maintained by the Navy until concentrations of hazardous substances in soil decrease to levels that allow for unlimited use and unrestricted exposure. The Navy or any subsequent owners shall not modify, delete, or terminate any LUC without USEPA and FDEP concurrence. The Navy is responsible for implementing, maintaining, reporting on, and enforcing the LUCs described in this ROD. Although the Navy may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Navy shall retain ultimate responsibility for the remedy integrity. Should any LUC remedy fail, the Navy will ensure that appropriate actions are taken to reestablish the remedy's protectiveness and may initiate legal action to either compel action by a third party(ies) and/or to recover the Navy's costs for remediating any discovered LUC violation(s).

The LUC implementation actions including monitoring and enforcement requirements will be provided in a LUC RD that will be prepared by the Navy as the LUC component of the overall RD. Within 90 days of ROD signature, the Navy shall prepare and submit to USEPA and FDEP for review and approval (pursuant to those Primary Document review procedures stipulated in the NAS Whiting Field FFA) the LUC RD for Site 41 that shall contain implementation and maintenance actions, including periodic inspections. The Navy will maintain, monitor, and enforce the LUCs according to the LUC RD. LUCs have been developed in accordance with the Principles and Procedures for Specifying, Monitoring, and Enforcement of Land Use Controls and Other Post-ROD Actions, per letter dated October 2, 2003, from Raymond F. DuBois, Deputy Under Secretary of Defense (Installations and Environment), to Hon. Marianne Lamont Horinko, Acting Administrator, USEPA.

2.12.3 Cost of Selected Remedy

As noted in Table 2-5, the estimated costs for the Selected Remedy at Site 41 include capital costs (soil excavation, confirmatory sampling, and sign placement) of approximately \$80,000, annual costs (annual compliance inspections and 5-year reviews) of approximately \$26,000, and a total NPW (at a 6% discount rate) of \$106,000 over the projected 30-year term of the LUCs. Detailed costs for the Selected Remedy are presented in Appendix B.

2.12.4 Expected Outcomes of Selected Remedy

It is expected that the Selected Remedy will be protective of human health and the environment while allowing for continued non-residential uses of the land and facilities within the boundaries of Site 41. It is estimated that the RAO for Site 41 will be achieved within approximately 1 month of implementation of the Selected Remedy.

Table 2-7 describes how the Selected Remedy mitigates risk and achieves the RAO for Site 41.

TABLE 2-7. HOW SELECTED REMEDY MITIGATES RISK AND ACHIEVES THE RAO		
RISK	RAO	COMMENTS
Direct exposure to, ingestion of, and inhalation of contaminated soil	Prevent unacceptable human health risk associated with exposure to soil containing cPAHs and diedrin at concentrations greater than industrial SCTLs	Excavation of soil to meet risk-based industrial SCTLs will remove soil associated with unacceptable risk under an industrial use scenario. LUCs will limit exposures via ingestion, dermal contact, and inhalation that result in unacceptable risks under a hypothetical future residential use scenario by preventing residential use and by preventing uncontrolled excavation or disturbance of soil from the site.

2.13 STATUTORY DETERMINATIONS

In accordance with Section 121(b) of CERCLA and the NCP, the Selected Remedy meets the following statutory determinations:

- **Protection of Human Health and the Environment** – The Selected Remedy is needed to prevent estimated current and future risks associated with maintenance and occupational worker exposure to contaminated surface soil. Excavation of soil to achieve industrial SCTLs will be conducted and LUCs will be implemented to ensure current protectiveness. Implementation of the Selected Remedy does not pose any short term risks or cross-media impacts.
- **Compliance with ARARs** – The Selected Remedy will attain all identified federal and state ARARs, as presented in Appendix A.
- **Cost-Effectiveness** – The Selected Remedy is the most cost-effective alternative that allows for continued industrial use of the property and represents the most reasonable value for the money. The costs are proportional to overall effectiveness by achieving an adequate amount of long-term effectiveness and permanence within a reasonable time frame. Detailed costs for the Selected Remedy are presented in Appendix B.
- **Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable** – The Selected Remedy represents the maximum extent to which permanent solutions and alternative treatment technologies can be used in a practical manner at Site 41. Due to the relatively broadly distributed soil, contaminated with low levels of hazardous substances, for which treatment does not represent the best balance of options, and the current and reasonably anticipated future use of the site, treatment alternatives were not evaluated for Site 41 in the FS. Excavation and off-site disposal of soil with COC concentrations exceeding commercial/industrial SCTLs provides the best balance of tradeoffs for long-term effectiveness and permanence with ease of implementation for a reasonable cost.
- **Preference for Treatment as a Principal Element** – Treatment is not a principal element of the Selected Remedy for soil at Site 41. Due to the relatively broadly distributed soil, contaminated with low levels of hazardous substances, for which treatment is not the best option; the current and reasonably anticipated future use of the site; and because there are no principal threat wastes at the site, the Selected Remedy does not meet the statutory preference for treatment.
- **Five-Year Review Requirement** – Because this remedy will result in COCs remaining on site in excess of levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within 5 years after initiation of remedial action and every 5 years thereafter to ensure that the remedy is protective of human health and the environment. In addition, annual LUC compliance inspections will be conducted.

2.14 DOCUMENTATION OF SIGNIFICANT CHANGES

CERCLA Section 117(b) requires an explanation of significant changes from the selected remedy presented in the Proposed Plan (Tetra Tech, 2011b) that was published for public comment. Although the opportunity for a public meeting was provided as stated in the Navy's public notice, none was requested, and no written comments, concerns, or questions were received by the Navy, USEPA, or FDEP during the public comment period.

3.0 RESPONSIVENESS SUMMARY

3.1 STAKEHOLDER COMMENTS AND LEAD AGENCY RESPONSES

As stated above, a public meeting was not requested, and no written comments, concerns, or questions were received during the public comment period.

3.2 TECHNICAL AND LEGAL ISSUES

No technical or legal issues associated with the Site 41 ROD were identified.

4.0 REFERENCES

Florida Department of Environmental Protection (FDEP), 2005. Soil Cleanup Target Levels (SCTLs). Chapter 62-777, Florida Administrative Code (F.A.C.). April.

Tetra Tech NUS, Inc. (Tetra Tech), 2010. Remedial Investigation Report for Surface and Subsurface Soil, OU 27 - Site 41, Naval Air Station Whiting Field, Milton, Florida. Prepared for NAVFAC SE, Jacksonville, Florida. April.

Tetra Tech, 2011a. Feasibility Study for OU 27 – Site 41 Surface and Subsurface Soil, Naval Air Station Whiting Field, Milton, Florida. Prepared for NAVFAC SE, Jacksonville, Florida. March.

Tetra Tech, 2011b. Proposed Plan for OU 27 – Site 41 Surface and Subsurface Soil, Naval Air Station Whiting Field, Milton, Florida. Prepared for NAVFAC SE, Jacksonville, Florida. March.

United States Environmental Protection Agency (USEPA) 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA.

USEPA, 1991. Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions, OSWER Directive 9355.0-30, Don R. Clay, April.

USEPA, 2001. Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim Guidance, Office of Emergency and Remedial Response, Washington D.C., September.

USEPA, 2008. Regional Screening Levels (Soil Screening Levels). USEPA Region 4, Atlanta, GA. April.

ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
B(a)P	Benzo(a)pyrene
bls	Below land surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CG	Cleanup goal
COC	Contaminant of concern
COPC	Contaminant of potential concern
cPAH	Carcinogenic polynuclear aromatic hydrocarbon
CSF	Cancer slope factor
CSM	Conceptual Site Model
CTE	Central tendency exposure
DDD	4,4-dichlorodiphenyldichloroethane
DDE	4,4-dichlorodiphenyldichloroethylene
DDT	4,4-dichlorodiphenyltrichloroethane
DPT	Direct push technology
EPC	Exposure point concentration
ERA	Ecological risk assessment
ER, N	Environmental Restoration, Navy
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FFA	Federal Facility Agreement
FID	Flame ionization detector
FS	Feasibility Study
GRA	General Response Action
HHRA	Human health risk assessment
HQ	Hazard quotient
ILCR	Incremental lifetime cancer risk
IR	Installation Restoration
LUC	Land use control
mg/kg	Milligram per kilogram
NAS	Naval Air Station
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPW	Net present worth
O&M	Operation and maintenance
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PSC	Potential Source of Contamination
PPE	Personal protective equipment
RAB	Restoration Advisory Board
RAO	Remedial Action Objective
RD	Remedial Design
RfD	Reference dose
RI	Remedial Investigation
RME	Reasonable maximum exposure
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SCTL	Soil Cleanup Target Level
SMP	Site Management Plan
SPLP	Synthetic Precipitation Leaching Procedure

ACRONYMS (CONT.)

SSL	Soil Screening Level
SVOC	Semivolatile organic compound
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TRPH	Total recoverable petroleum hydrocarbons
UCL	Upper confidence limit
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
UST	Underground storage tank
VOC	Volatile organic compound

Appendix A

ARARs Table for Selected Remedy

ARARs to be Met by the Selected Remedy

Requirement	Citation	ARAR Type	Description	Prerequisite
Resource Conservation and Recovery Act (RCRA) Regulations – Identification and Listing of Hazardous Wastes	40 Code of Federal Regulations (CFR) Part 262.11 and 264.13(a)(1)	Applicable	Requires characterization of solid waste and additional characterization of waste determined to be hazardous. Part 261.11 requires determination of whether solid waste is hazardous. Part 263.13(a)(1) requires a detailed chemical and physical analysis of a representative sample of the waste to determine treatment, storage, and disposal requirements.	Response action is expected to generate non-hazardous solid waste (contaminated soil determined not to be hazardous).
RCRA – Land Disposal Restrictions (LDRs) Treatment Standards for Contaminated Soil	40 CFR Part 268.7 and 268.49	Applicable	40 CFR Part 268.7 requires determination of whether waste is restricted from land disposal under 40 CFR 268 et. seq. by testing in accordance with prescribed methods or by use of generator knowledge of the waste. 40 CFR 268.49 prohibits land disposal of untreated hazardous wastes and provides treatment standards for contaminated soil considered hazardous waste.	Excavated soil determined to be hazardous waste will be sent off site for treatment and disposal at an appropriate facility.
RCRA Regulations – Use and Management of Containers	40 CFR Part 265.171 to 173	Applicable	Establish requirements for use and management of hazardous waste in containers.	Containers that may be used for temporary storage of hazardous waste (i.e., contaminated soil) on site prior to off-site treatment and disposal will comply with these requirements.
RCRA Regulations – Storage of Hazardous Waste in Staging Pile	40 CFR Part 264.554(a)(1)(i)-(iii) and 40 CFR 264.554(i)(1)	Relevant and Appropriate	Provides requirements for temporary storage and closure of non-flowing hazardous remediation waste in a staging pile to prevent or minimizes releases of hazardous substances or constituents into the environment.	Storage area for contaminated soil temporarily staged on-site will consider these requirements.

ARARs to be Met by the Selected Remedy

Requirement	Citation	ARAR Type	Description	Prerequisite
RCRA Regulations – Transportation of Hazardous Waste	40 CFR Part 262.10(h)	Applicable	An owner or operator who initiates a shipment of hazardous waste from a treatment, storage, or disposal facility must comply with the generator standards established in this part, including the requirements of 40 CFR 262.20-23 for manifesting; Section 262.30 for packaging; Section 262.31 for labeling; Section 262.32 for marking; Section 262.33 for placarding; Section 262.41(a) for record-keeping; and Section 262.12 to obtain EPA ID number.	Hazardous waste requiring off-site disposal will meet transportation requirements.
Florida Solid Waste Management Facilities Regulations	Chapter 62-701.300, Florida Administrative Code (F.A.C.)	Relevant and Appropriate	Prohibits storage, processing, or disposal except at a permitted solid waste management facility.	Waste generated on site and deemed nonhazardous solid waste will be stored, transported, and disposed of properly.
Florida General Pollutant Emission Limitation Standards	Chapter 62-296.320(4)(c), F.A.C.	Applicable	Requires reasonable precautions, such as application of water or other dust suppressants, to control emission of particulate matter from any activity including but not limited to, vehicular movement and construction.	Precautions will be undertaken to prevent fugitive dust emissions from any land disturbing activities.
Florida Regulation of Stormwater Discharge – Facility Performance Standards	Chapter 62-25.025(7), F.A.C.	Relevant and Appropriate	Establishes requirements for discharges from stormwater discharge facility to ensure protection of the surface waters of the state.	Erosion and stormwater control BMPs will be implemented during construction to retain sediment on site.
Florida Generic Permit for Stormwater Discharge from Construction Activities	Chapter 62-621.300(4)(a), F.A.C.	Applicable	Requires development and implementation of best management practices (BMPs) and erosion and sedimentation controls for stormwater discharges to ensure protection of the surface waters of the state.	Erosion and stormwater control BMPs will be implemented during construction activity such as well installation to retain sediment on site.

ARARs to be Met by the Selected Remedy

Requirement	Citation	ARAR Type	Description	Prerequisite
Florida Contaminant Cleanup Target Levels Rule	Chapter 62-777.170, F.A.C., Table II	Relevant and Appropriate	This rule provides default cleanup criteria, namely cleanup target levels (CTLs) in Table II and an explanation for deriving CTLs for soil and surface water that can be used for site rehabilitation (i.e., cleanup).	SCTLs in Table II for Direct Exposure and Leachability Based on Groundwater Criteria were used to establish cleanup goals for the soil COCs.

Appendix B

Cost Estimate

NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA
SITE 41

SOIL ALTERNATIVE S41-2: SURFACE AND SUBSURFACE SOIL (exceeding FDEP Industrial STCLs) REMOVAL, TRANSPORT, AND OFFSITE DISPOSAL AND LUCs
CAPITAL COSTS

Cost Item	Quantity	Unit	Subcontract			Unit Cost			Extended Cost			Equipment	Subtotal
			Subcontract	Material	Labor	Subcontract	Material	Labor	Subcontract	Material	Labor	Equipment	
1 PROJECT PLANNING													
1.1 Prepare Remedial Design	80	hr			\$33.79			\$2,703	\$0	\$0	\$2,703	\$0	\$2,703
1.2 Construction Completion Report	40	hr			\$33.79			\$1,352	\$0	\$0	\$1,352	\$0	\$1,352
1.3 Project Scheduling and Procurement	40	hr			\$33.79			\$1,352	\$0	\$0	\$1,352	\$0	\$1,352
2 MOBILIZATION/DEMOLITION													
2.1 Equipment Mobilize/Demob (Exc., Loader, & Dozer)	2	ea			\$200.00			\$400	\$0	\$0	\$400	\$1,000	\$1,400
2.2 Mobilize/Demobilize Personnel (3-persons)	2	ea			\$300.00			\$600	\$0	\$750	\$600	\$0	\$1,350
2.3 Portable Toilet	1	mo	\$74.18					\$0	\$74	\$0	\$0	\$0	\$74
2.4 Storage Trailer (28' x 10')	1	mo	\$98.33					\$0	\$98	\$0	\$0	\$0	\$98
2.5 Office Trailer (32' x 8')	0	mo	\$221.49					\$0	\$0	\$0	\$0	\$0	\$0
2.6 Site Utilities	0	mo	\$1,000.00					\$0	\$0	\$0	\$0	\$0	\$0
3 DECONTAMINATION													
3.1 Temporary Decon Pad	1	ls			\$850.00			\$850	\$0	\$850	\$500	\$265	\$1,615
3.2 Decon Water Disposal	5	drum	\$125.00					\$0	\$625	\$0	\$0	\$0	\$625
3.3 Decon Water Storage Drums	5	ea			\$45.00			\$225	\$0	\$225	\$0	\$0	\$225
3.4 PPE (3 p * 5 days * 3 Weeks)	12	m-day			\$30.00			\$360	\$0	\$360	\$0	\$0	\$360
3.5 Decontaminate Equipment (Pressure Washer)	8	ea			\$134.45			\$500	\$0	\$500	\$1,076	\$400	\$1,476
4 SITE PREPARATION													
4.1 Erosion Control Fencing	500	lf			\$0.23			\$115	\$0	\$115	\$585	\$0	\$700
4.2 Collect/Analyze Delineation Samples (cPAHs & others)	5	ea	\$250.00		\$23.52			\$118	\$1,250	\$50	\$118	\$0	\$1,418
4.3 Construction Surveys (2-man crew)	2	day	\$850.00					\$0	\$1,700	\$0	\$0	\$0	\$1,700
4.4 Utility Location and Site Delineation/Layout	1	ls	\$1,500.00		\$33.23			\$33	\$1,500	\$0	\$33	\$0	\$1,533
4.5 Concrete Demolition/Removal (6" reinforced)	0	cy	\$45.58					\$0	\$0	\$0	\$0	\$0	\$0
4.6 Site Foreman/FOL	3	day			\$300.00			\$900	\$0	\$0	\$900	\$0	\$900
5 EXCAVATION/BACKFILL													
5.1 Excavate/Load Contaminated Soil (2.0 cy Hyd. Exc.	5	day			\$250.00			\$1,250	\$0	\$0	\$1,250	\$6,000	\$7,250
5.2 Standby, Crawler Mounted 2.0 CY Hydraulic Excavator	40	hrs			\$37.54			\$0	\$0	\$0	\$0	\$1,502	\$1,502
5.3 Wheel Loader, 3 cy	5	day			\$250.00			\$0	\$0	\$0	\$1,250	\$2,300	\$3,550
5.4 Standby, Wheel Loader, 3 cy	20	hrs			\$188.16			\$0	\$0	\$0	\$0	\$281	\$281
5.5 Health & Safety Monitoring during Excavator	5	day			\$23.52			\$118	\$1,250	\$50	\$118	\$500	\$1,441
5.6 Collect/Analyze Confirmatory Samples	5	ea	\$250.00		\$10.00			\$50	\$1,250	\$50	\$118	\$0	\$1,418
5.7 Import (Offsite) Place, Compact Clean Fill Material	88	cy			\$7.82			\$688	\$0	\$688	\$75	\$159	\$922
5.8 Backfill with Clean Excavated Material	0	cy			\$0.28			\$0	\$0	\$0	\$0	\$0	\$0
5.9 Site Foreman/FOL	7	day			\$300.00			\$2,100	\$0	\$0	\$2,100	\$0	\$2,100
6 OFF-SITE TRANSPORTATION/ DISPOSAL													
6.1 Waste Profile	2	ls	\$750.00					\$0	\$1,500	\$0	\$0	\$0	\$1,500
6.2 Transport and Dispose of Soil (Non-haz.) in Landfill	123	ton	\$45.00					\$0	\$5,535	\$0	\$0	\$0	\$5,535
6.3 Prepare Shipment Manifests	20	hrs			\$33.23			\$665	\$0	\$0	\$665	\$0	\$665
7 SITE RESTORATION													
7.1 Top soil /gravel (haul and spread)	1500	sf	\$0.40					\$0	\$600	\$0	\$0	\$0	\$600
8 LAND USE CONTROLS													
8.1 Site Survey (2-man crew)	1	days	\$648.36					\$0	\$648	\$0	\$0	\$0	\$648
8.2 Modify Master Plan and Prepare Deed Restrictions	20	hrs			\$33.79			\$676	\$0	\$0	\$676	\$0	\$676
Subtotal Direct Capital Costs less Subcontract								\$3,088	\$16,691	\$12,407	\$32,187		

NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA
SITE 41
SOIL ALTERNATIVE S41-2: SURFACE AND SUBSURFACE SOIL (exceeding FDEP Industrial STCLs) REMOVAL, TRANSPORT, AND OFFSITE DISPOSAL AND LUCs
CAPITAL COSTS

Cost Item		Quantity	Unit	Subcontract	Unit Cost		Labor	Equipment	Subcontract	Extended Cost		Labor	Equipment	Subtotal	
Local Area Adjustment															
Overhead on Labor Cost @ 30%															
G & A on Labor Cost @ 10%															
G & A on Material Cost @ 10%															
Total Direct Capital Cost															
Indirects on Total Direct Labor Cost @ 75%															
Profit on Total Direct Cost @ 10%															
Subtotal															
Health & Safety Monitoring @ 3%															
Total Field Cost															
Subtotal Subcontractor Cost															
G & A on Subcontract Cost @ 10%															
Profit on Subcontractor Cost @ 5%															
Subcontractor Cost															
Contingency on Total Field and Subcontractor Costs @ 10%															
Engineering on Total Field and Subcontractor Costs @ 5%															
TOTAL CAPITAL COST															

NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA
SITE 41
SOIL ALTERNATIVE S41-2: SURFACE AND SUBSURFACE SOIL (exceeding FDEP Industrial STCLs) REMOVAL, TRANSPORT, AND OFFSITE DISPOSAL A
Operation and Maintenance Costs per Year

Item	Qty	Unit	Unit Cost	Subtotal Cost	Notes
1 Energy - Electric		kWh	\$0.06	\$0	
2 Maintenance		ls		\$0	5% of Installation Cost
3 Carbon Unit Changeout/Regeneration of Spent Carbon		pound	\$3.00	\$0	once a year
4 Labor, Mobilization/Demobilization, Per Diem, Supplies		wk	\$925.00	\$0	1 visit per week - 1 day
5 Labor, Mobilization/Demobilization, Per Diem, Supplies		mo	\$1,950.00	\$0	1 visit per quarter - 2 laborers, 2 days
6 Analysis of Off-gas samples		ea	\$250.00	\$0	1 per month, VOCs
7 Quarterly Reports		ea	\$4,000.00	\$0	
Total Cost for One Year Operation				\$0	

NAVAL AIR STATION WHITING FIEL
MILTON, FLORIDA
SITE 41
SOIL ALTERNATIVE S41-2: SURFACE AND SUBSURFACE SOIL (exceeding FDEP Industrial STCLs) REMOVAL, TRANSPORT, AND OFF
ANNUAL COSTS

Cost Item	Quantity	Unit	Unit Cost	Labor Overhead ^a	Total Cost
1 FIVE YEAR SITE REVIEWS (FOR 30 YEAR PERIOD)					
1.1 Site Review Visit/Inspection					
Project Manager	0	hr	\$45.12	\$45.12	\$0
Staff Engineer	8	hr	\$35.44	\$35.44	\$567
ODCs (travel, etc.)	1	ls	\$200.00		\$200
1.2 Five Year Review Report					
Project Manager	4	hr	\$45.12	\$45.12	\$361
Staff Engineer	24	hr	\$35.44	\$35.44	\$1,701
ODCs (photocopies, telephone, etc.	1	ls	\$200.00		\$200
Subtotal Five Year Review Cos					\$3,029
G&A and Profit @ 15%					\$454
Subtotal					\$3,483
Contingency @ 10%					\$348.35
Total Five Year Review Cost					\$3,832
2 LAND USE CONTROL MONITORING (FOR 30 YEAR PERIOD)					
2.1 Site Inspections					
Project Manager	0	hr	\$45.12	\$45.12	\$0
Staff Engineer	4	hr	\$35.44	\$35.44	\$284
ODCs (travel, etc.)	1	ls	\$150.00		\$150
2.2 Annual Review and Report w/Checklist					
Project Manager	1	hr	\$45.12	\$45.12	\$90
Staff Engineer	4	hr	\$35.44	\$35.44	\$284
ODCs (photocopies, telephone, etc.	1	ls	\$50.00	\$50.00	\$50
2.3 Sign/Fence Maintenance	1	ls	\$100.00		\$100
Subtotal Land Use Control Monitoring:					\$957
G&A and Profit @ 15%					\$144
Subtotal					\$1,101
Contingency @ 10%					\$110.09
Total Land Use Control Monitoring Cos					\$1,211

^a Overhead on professional labor @ 100%

**NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA
SITE 41**

**SOIL ALTERNATIVE S41-2: SURFACE AND SUBSURFACE SOIL (exceeding FDEP Industrial STCLs) REMOVAL, TRANSPORT, AND OFFSITE DISPOS,
PRESENT WORTH ANALYSIS**

Year	Capital Cost	Operation and Maintenance Cost	Annual Cost	Total Yearly Cost	Present-Worth Factor (i = 6%)	Present Worth
0	\$80,369			\$80,369	1.000	\$80,369
1		\$0	\$1,211	\$1,211	0.943	\$1,142
2		\$0	\$1,211	\$1,211	0.890	\$1,078
3		\$0	\$1,211	\$1,211	0.840	\$1,017
4		\$0	\$1,211	\$1,211	0.792	\$959
5		\$0	\$5,043	\$5,043	0.747	\$3,768
6		\$0	\$1,211	\$1,211	0.705	\$854
7		\$0	\$1,211	\$1,211	0.665	\$805
8		\$0	\$1,211	\$1,211	0.627	\$760
9		\$0	\$1,211	\$1,211	0.592	\$717
10		\$0	\$5,043	\$5,043	0.558	\$2,816
11		\$0	\$1,211	\$1,211	0.527	\$638
12		\$0	\$1,211	\$1,211	0.497	\$602
13		\$0	\$1,211	\$1,211	0.469	\$568
14		\$0	\$1,211	\$1,211	0.442	\$536
15		\$0	\$5,043	\$5,043	0.417	\$2,104
16		\$0	\$1,211	\$1,211	0.394	\$477
17		\$0	\$1,211	\$1,211	0.371	\$450
18		\$0	\$1,211	\$1,211	0.350	\$424
19		\$0	\$1,211	\$1,211	0.331	\$400
20		\$0	\$5,043	\$5,043	0.312	\$1,572
21		\$0	\$1,211	\$1,211	0.294	\$356
22		\$0	\$1,211	\$1,211	0.278	\$336
23		\$0	\$1,211	\$1,211	0.262	\$317
24		\$0	\$1,211	\$1,211	0.247	\$299
25		\$0	\$5,043	\$5,043	0.233	\$1,175
26		\$0	\$1,211	\$1,211	0.220	\$266
27		\$0	\$1,211	\$1,211	0.207	\$251
28		\$0	\$1,211	\$1,211	0.196	\$237
29		\$0	\$1,211	\$1,211	0.185	\$223
30		\$0	\$5,043	\$5,043	0.174	\$878
TOTAL PRESENT WORTH						\$106,394

Appendix C

Risk Tables

TABLE D-1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - RESIDENTIAL EXPOSURES TO SURFACE SOIL
SITE 41
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL ⁽¹⁾ (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL ⁽¹⁾ (mg/kg)	Estimated HQ
Carcinogenic PAHs	1.02	0.1	1E-05	Cancer	NA	NA
Dieldrin	0.125	0.06	2E-06	Cancer, Liver	2.95	0.04
Chromium	30.6	210	1E-07	Cancer, Respiratory	234	0.1
		Total ILCR	1E-05		Total HI	0.2

1 - Table II Soil Cleanup Target Levels (FDEP, April 2005). Some noncarcinogenic SCTLs not presented in Table II were calculated as per the methodology presented in Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Final Report, February, 2005.

NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE D-2

**SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - TYPICAL INDUSTRIAL EXPOSURES TO SURFACE SOIL
SITE 41
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA**

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL ⁽¹⁾ (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL ⁽¹⁾ (mg/kg)	Estimated HQ
Carcinogenic PAHs	1.02	0.7	1E-06	Cancer	NA	NA
Dieldrin	0.125	0.3	4E-07	Cancer, Liver	27	0.005
Chromium	30.6	470	7E-08	Cancer, Respiratory	5940	0.005
		Total ILCR	2E-06		Total HI	0.01

1 - Table II Soil Cleanup Target Levels (FDEP, April 2005). Some noncarcinogenic SCTLs not presented in Table II were calculated as per the methodology presented in Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Final Report, February, 2005.

NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE D-3
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKERS EXPOSED TO SURFACE SOIL
SITE 41
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL ⁽¹⁾ (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL ⁽¹⁾ (mg/kg)	Estimated HQ
Carcinogenic PAHs	1.02	2.1	5E-07	Cancer	NA	NA
Dieldrin	0.125	1.00	1E-07	Cancer, Liver	11.4	0.01
Chromium	30.6	21.2	1E-06	Cancer, Respiratory	266	0.1
		Total ILCR	2E-06		Total HI	0.1

1 - SCTLs were calculated as per the methodology presented in Section 6.3.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE D-4
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - MAINTENANCE WORKERS EXPOSED TO SURFACE SOIL
SITE 41
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL ⁽¹⁾ (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL ⁽¹⁾ (mg/kg)	Estimated HQ
Carcinogenic PAHs	1.02	2.4	4E-07	Cancer	NA	NA
Dieldrin	0.125	1.19	1E-07	Cancer, Liver	340	0.0004
Chromium	30.6	3606	8E-09	Cancer, Respiratory	49503	0.0006
		Total ILCR	5E-07		Total HI	0.001

1 - SCTLs were calculated as per the methodology presented in Section 6.3.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE D-5
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADOLESCENT RECREATIONAL USERS EXPOSED TO SURFACE SOIL
SITE 41
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL ⁽¹⁾ (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL ⁽¹⁾ (mg/kg)	Estimated HQ
Carcinogenic PAHs	1.02	1.5	7E-07	Cancer	NA	NA
Dieldrin	0.125	0.8	2E-07	Cancer, Liver	91.2	0.001
Chromium	30.6	16099	2E-09	Cancer, Respiratory	10908	0.003
		Total ILCR	8E-07		Total HI	0.004

1 - SCTLs were calculated as per the methodology presented in Section 6.3.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE D-6
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - ADULT RECREATIONAL USERS EXPOSED TO SURFACE SOIL
SITE 41
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL ⁽¹⁾ (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL ⁽¹⁾ (mg/kg)	Estimated HQ
Carcinogenic PAHs	1	1.8	6E-07	Cancer	NA	NA
Dieldrin	0.1	0.871	1E-07	Cancer, Liver	195	0.0006
Chromium	31	9391	3E-09	Cancer, Respiratory	16946	0.002
		Total ILCR	7E-07		Total HI	0.002

1 - SCTLs were calculated as per the methodology presented in Section 6.3.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE D-7
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - LIFELONG RECREATIONAL USERS EXPOSED TO SURFACE SOIL
SITE 41
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL ⁽¹⁾ (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL ⁽¹⁾ (mg/kg)	Estimated HQ
Carcinogenic PAHs	1.02	0.8	1E-06			
Dieldrin	0.125	0.417	3E-07			
Chromium	30.6	5931	5E-09			
		Total ILCR	2E-06		Total HI	

1 - SCTLs were calculated as per the methodology presented in Section 6.3.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE D-8
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS - RESIDENTIAL EXPOSURES TO SURFACE SOIL
SITE 41
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL ⁽¹⁾ (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL ⁽¹⁾ (mg/kg)	Estimated HQ
Carcinogenic PAHs	0.288	0.1	3E-06	Cancer	NA	NA
4,4'-DDT	1.73	2.9	6E-07	Cancer, Liver	36.0	0.05
Aldrin	0.161	0.06	3E-06	Cancer, Liver	1.81	0.09
Dieldrin	0.171	0.06	3E-06	Cancer, Liver	2.95	0.06
		Total ILCR	9E-06		Total HI	0.2

1 - Table II Soil Cleanup Target Levels (FDEP, April 2005). Some noncarcinogenic SCTLs not presented in Table II were calculated as per the methodology presented in Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Final Report, February, 2005.

NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE D-9
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - TYPICAL INDUSTRIAL EXPOSURES TO SURFACE SOIL
SITE 41
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL ⁽¹⁾ (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL ⁽¹⁾ (mg/kg)	Estimated HQ
Carcinogenic PAHs	0.288	0.7	4E-07	Cancer	NA	NA
4,4'-DDT	1.73	15	1E-07	Cancer, Liver	586	0.003
Aldrin	0.161	0.3	5E-07	Cancer, Liver	17.4	0.009
Dieldrin	0.171	0.3	6E-07	Cancer, Liver	27.1	0.006
		Total ILCR	2E-06		Total HI	0.02

1 - Table II Soil Cleanup Target Levels (FDEP, April 2005). Some noncarcinogenic SCTLs not presented in Table II were calculated as per the methodology presented in Technical Report: Development of Soil Cleanup Target Levels (SCTLs) for Chapter 62-777, F.A.C., Final Report, February, 2005.

NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

TABLE D-10
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - CONSTRUCTION WORKERS EXPOSED TO SURFACE SOIL
SITE 41
NAVAL AIR STATION, WHITING FIELD
MILTON, FLORIDA

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration (mg/kg)	SCTL ⁽¹⁾ (mg/kg)	Estimated ILCR	Primary Target Organs	SCTL ⁽¹⁾ (mg/kg)	Estimated HQ
Carcinogenic PAHs	0.288	2.10	1E-07	Cancer	NA	NA
4,4'-DDT	1.73	57.1	3E-08	Cancer, Liver	139	0.01
Aldrin	0.161	0.956	2E-07	Cancer, Liver	6.97	0.02
Dieldrin	0.171	1.00	2E-07	Cancer, Liver	11.4	0.01
		Total ILCR	5E-07		Total HI	0.05

1 - SCTLs were calculated as per the methodology presented in Section 6.3.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

Appendix D

Response To Comments

**RESPONSE TO USEPA COMMENTS
ON DRAFT ROD FOR SITE 41**

**FORMER PESTICIDE STORAGE BUILDING 1485C
NAS WHITING FIELD**

USEPA comments issued September 23, 2010, from Mr. Craig Benedikt, USEPA, to Mr. Benjamin Kissam, RPM NAVFAC SE.

1. In some places within the document, the terms “unrestricted use and unlimited exposure” are used; and in other places, the terms “unlimited use and unrestricted exposure” are used. Please decide which terms are appropriate and revise the document accordingly.

Response: *Agreed, the document has been updated so the terms “unrestricted use and unlimited exposure” are used consistently throughout the document.*

2. **Section 1.3, Page 2:** Please delete “actual or threatened” in the first sentence. The presence of contamination has been determined through sampling and analysis.

Response: *This change has been made.*

3. **Section 1.4, Page 2:** Please delete the word “potential” in the first sentence under the bulleted items. In addition, please add the following to the end of the first sentence: “...and to preclude any activities that may disturb the soils without prior authorization.”

Response: *These changes have been made.*

4. **Section 2.1, Page 4:** The fourth sentence in the second paragraph should also indicate that an unknown quantity of soil was removed as well as the building materials and the concrete slab.

Response: *Agreed, the sentence has been revised as follows:*

“Following the fire, cleanup activities at the site included the removal of all building materials, the concrete slab flooring, and an unknown quantity of soil.”

5. **Section 2.3, Page 6:** Please add “the” between “with” and “NAS” in the first full sentence at the top of the page.

Response: *This change has been made.*

6. **Section 2.4, Page 6:** Please state that the FFA became effective on July 10, 2009, in the first sentence of this section. The third sentence of this section states that Site 31 required no further investigation; however, a No Further Action ROD was signed for Site 31 in September of 2002.

Response: *Agreed, the subject sentences of Section 2.4 have been revised as follows:*

“...under CERCLA authority pursuant to the Federal Facility Agreement (FFA) dated March 9, 2009 (effective July 10, 2009).” and;

“A No Further Action ROD for soil at Site 31 was signed in September 2002, ...”

7. **Section 2.5, Page 6:** The second sentence of this section states that the source of contamination is unknown; however as previously stated in the text of the ROD, the former building was utilized for pesticide storage. The fact that the building was utilized to store pesticides and pesticide contamination has been found in onsite soils points to clear evidence of a source of contamination. Please delete the word “the” following “at” in the second sentence of Section 2.5.1.

Response: *Agreed, the second sentence of Section 2.5 has been revised as follows:*

“The source of contamination at Site 41 is likely related to pesticide and equipment storage, and potential contaminant release and transport mechanisms include precipitation infiltration and migration to subsurface soil and runoff and erosion of contaminated soil via wind and/or stormwater runoff.”

8. **Section 2.6, Page 9:** Please add the following to the end of the last sentence in the second full paragraph: “...with input from the EPA and FDEP.”

Response: *This change has been made.*

9. **Section 2.7.1, Page 10:** Please add the word “The” to the beginning of the first sentence in the “Toxicity Assessment” subsection.

Response: *This change has been made.*

10. **Section 2.7.1, Page 11:** Please remove all references to other causes of cancer in the second paragraph of the “Risk Characterization” subsection. This information is not relevant to the discussion and uses a different set of scientific data to determine risk.

Response: *The second paragraph of the “Risk Characterization” subsection has been revised as follows:*

“For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the carcinogen. These calculated risks are probabilities that are usually expressed in scientific notation (e.g., 1×10^{-6}). An excess lifetime cancer risk of 1×10^{-6} under an RME scenario indicates that an individual experiencing the reasonable maximum exposure estimate has a 1 in 1 million chance of developing cancer as a result of site-related exposure. USEPA’s generally acceptable risk range for site-related exposures is 1 in 10,000 to 1 in 1 million (1×10^{-4} to 1×10^{-6}) and FDEP has a target risk of 1 in 1 million (1×10^{-6}).”

11. **Section 2.7.3, Page 12:** Please add “in conjunction with LUCs” in the first sentence of the second paragraph between “action” and “allowing”.

Response: *This change has been made.*

12. **Section 2.10, Page 15:** In the fourth sentence of the “Implementability” subsection, please change “includes” to “include” and change “LUC” to “LUCs”. In the “Cost” subsection on this page, please add “(Alternative S41-2)” following “LUCs” in the first part of the sentence; and please add “(Alternative S41-3)” after “SCTLs” in the second part of the sentence.

Response: *These changes have been made.*

13. **Section 2.12.2, Page 16:** In the first bulleted item, delete the word “Navy” since the Navy would not need to prior written approval from itself before changing site usage. In the second bulleted item, please insert “from” between “soil” and “the” and delete the word “Navy”. In the third bulleted item, please delete the word “Navy”.

Response: *These changes have been made.*

The following comments were provided by Martha Brock, Region 4 Associate Legal Counsel:

Comments:

1. **Section 1.2, page 2.** See comment 2, and please move the last sentence in this section to the to-be-added description, in Section 1.4, of the overall site cleanup strategy. The last sentence, which states that the groundwater will be addressed in a later action, fits better there.

Response: *These changes have been made (see response to Comment #2 below).*

2. **Section 1.4, page 2.** EPA Guidance indicates that this section should contain a brief explanation of the overall site cleanup strategy. Please include a brief description of how this action fits into the overall site management plan. That is, please describe the intended sequence and timing of the operable units and identify the selected performance standards. This description could be placed immediately prior to the last sentence in this section.

Response: *Agreed, the following text has been added to Section 1.4 on page 2:*

“Environmental work at Site 41 is part of the Navy’s ongoing Installation Restoration Program that includes 27 OUs at NAS Whiting Field. This is a Department of Defense program to investigate and, if necessary, cleanup conditions related to suspected past releases of hazardous materials at military facilities. Currently, 24 of the 27 OUs at NAS Whiting Field have final RODs detailing remedy selection and remedial implementation at those OUs has either been completed or is ongoing.”

3. **Section 1.4, page 2.** EPA Guidance indicates that this section should include a brief description of how the selected remedy addresses source materials that constitute principal threats. Since this site does not contain principal threats, but does contain lower threat source material which are being removed to return the site to its current and reasonably anticipated land use, a statement to that effect would be consistent with the remedial action and EPA Guidance.

Response: *The last sentence of Section 1.4 on page 2 has been edited as follows:*

“Implementation of the remedy at Site 41 will remove low threat source material and return the site to its reasonably anticipated land use allowing industrial/commercial reuse of the site, which is consistent with current use and the overall cleanup strategy for NAS Whiting Field of restoring sites to support base operations.”

4. **Section 1.4, page 2.** In this section and elsewhere, the discussion distinguishes between residential versus non-residential uses in some places and between residential and industrial/commercial in others. Please clarify whether any other use than residential is protective after remediation; for instance, is recreational use protective?

Response: *Only industrial/commercial land use will be protective at Site 41 after remediation.*

5. **Section 1.5, page 2.** Please make the following change and add the following statement after “make treatment impracticable; . . .”. Please change the semi-colon in that sentence to a period, and add the new sentence immediately after the new period:

“In addition, no source constituting principal threats will be addressed within the scope of this action.”

Response: *These changes have been made.*

6. **Section 2.2, page 5.** EPA Guidance indicates that an important piece of information is whether the site was in operation before or after the effective date of key RCRA regulations, such as November 19, 1980. Please clarify whether this site was in operation at that time.

Response: *Agreed, the following sentence has been added to Section 2.1 – Site Name, Location, and Brief Description:*

“The site has been in use since the early 1960s.”

7. **Section 2.5, page 6.** The text refers to Figure 2-2 as the Conceptual Site Model. Please clarify which part of Figure 2-2 demonstrates the origin of the contamination. I would have presumed that the figure would have shown past storage, mixing and handling of pesticides as the mechanisms likely to have resulted in release of hazardous substances to the environment. The text states that the source of the contamination is unknown, but that the source may have been related to past pesticide storage, etc.,. Please change “are unknown” to “are not precisely known” and add “in terms of specific timing, incident or process.” In order to be consistent with the following section, the text should also reflect that it is likely (not merely “may”) that the past storage, mixing and handling of pesticide at this former pesticide storage facility was the source of the contamination at this site. Please change “may” to “is likely.”

Response: Figure 2-2 has been updated and the subject text in Section 2.5 has been revised as described in the response to Comment #7 (from Craig Benedikt) above. In addition, the first paragraph of Section 2.5.2 has been revised as follows:

"The RI concluded that the release of contaminants at Site 41 appears to have resulted from storage and disposal of pesticides used for maintenance of the base grounds and other undocumented activities at the site. The source and nature of materials and the time of disposal are not precisely known in terms of specific timing, incident or process."

8. **Section 2.7.1, page 10.** In the first full paragraph, please add the following parenthetical after "unlikely", (i.e., is not the reasonably anticipated land use)."

Response: This change has been made.

9. **Section 2.7.1, page 11.** The second full paragraph contains a couple of statements about the chance of developing cancer from other causes and that such risk has been estimated to be as high as one in three. The other causes mentioned are smoking and "too much sun." This report is not intended to summarize the science of societal cancer risks, and it is suggested that these statements be deleted. If, however, this report is going to provide a summary of societal cancer risks, please be more comprehensive, and include the "as low as," median and mean statistics, providing the citations for conclusions and statistics.

Response: Section 2.7.1 has been revised as requested (see Response to Comment #10 from Craig Benedikt above).

10. **Section 2.7.3, page 12.** In the first paragraph, please add ", as a policy matter," after "judgment that."

Response: This change was not made as it does not reflect Navy policy. The first paragraph in Section 2.7.3 has been revised per the language agreed upon by USEPA, FDEP, and the Navy (see March 7, 2011 e-mail from Craig Benedikt) and now reads as follows:

"The data demonstrate that the soil at Site 41 is characterized by both lateral and vertical contamination by cPAHs, dieldrin, 4-4'-DDT, and TRPH. Of these contaminants, cPAHs and dieldrin exceed Florida's industrial SCTLs in Chapter 62-777, Florida Administrative Code (F.A.C.), Table II, and all four contaminants exceed the residential SCTLs up to two orders of magnitude. Given the locations, types, and levels of contaminants discovered, and other general circumstances found at Site 41, it is the Navy's considered discretionary judgment that some form of remedial action is warranted at this site."

11. **Section 2.8, page 12.** It may be confusing to the reader to include the residential numbers in Table 2-3, since the title is Soil Cleanup Goals. It is not a goal of this action to achieve the residential soil cleanup number. Perhaps text and/or highlighting could be added to the table that would clarify this point. The main body text makes the point, but it remains confusing why residential values are labeled cleanup goals.

Response: *Agreed, a note has been added to Table 2-3 indicating that the Residential CGs are applicable to Alternative S41-3.*

12. **Section 2.8, page 12.** In the last paragraph, please change “SCLTs” to “SCTLs”.

Response: *This change has been made.*

13. **Section 2.10, page 14.** In “Threshold Criteria,” second paragraph, the ROD states that Alternative S41-3 “does not appropriately factor in the current and reasonably anticipated future land use (industrial).” Please change this to read, “does not factor in the current and reasonably future land use (industrial) as is allowed by EPA guidance. Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions, OSWER Directive 9355.0-30, Don R. Clay, April 22, 1991. The guidance does not discourage the evaluation of an unrestricted use scenario; it states that the unrestricted use scenario is not justified in all instances, as where the probability of residential use is small, and that evaluation of an unrestricted use scenario is not required in all instances, for example, where the reasonably anticipated land use is not residential/unrestricted.

Response: *The second paragraph has been revised to read as follows:*

“Although soil removal to achieve residential SCTLs, as contemplated under Alternative S41-3, would be the most protective of human health because it would permanently remove all unacceptable risks from exposure to soil COCs, this alternative does not factor in the current and reasonably anticipated future land use (industrial) as is allowed by USEPA guidance (USEPA, 1991). Soil excavation to meet industrial SCTLs would be consistent, and when combined with the appropriate LUCs to preclude the possibility of residential uses, would be adequately protective of human health and the environment.”

14. **Section 2.10, page 15.** In the section discussing reduction in toxicity, the last sentence concludes that treatment was deemed unnecessary. CERCLA Section 121 contains a statutory preference for treatment to reduce toxicity, mobility or volume through treatment. Deeming it unnecessary would be an inadequate justification for not meeting this preference.

Response: *The second sentence of the subsection has been revised as follows:*

“Because of the type of contamination detected at Site 41 and its relatively low long-term risk based on the current and reasonably anticipated future site use, soil treatment was deemed impracticable and would not be cost effective.”

15. **Section 2.12.2, page 17.** In the last paragraph, last line, please change “review and comment” to “review and approval” since EPA has approval authority for Remedial Design documents under the Whiting FFA.

Response: *This change has been made.*

16. **Section 2.13, page 18.** If a remedy is selected that does not employ treatment or resource recovery technologies, the explanation of the rationale used in the decision under this statutory finding must include the reasons for finding treatment to be impracticable. The explanation for not utilizing permanent solutions and treatment technologies becomes difficult when an alternative did not evaluate treatment for comparison. If there is additional information that underlay the decision not to evaluate a treatment alternative, please provide this as justification for the impracticability for such technologies.

Response: *There is not additional information underlying the decision not to evaluate a treatment alternative.*

17. **Appendix A.** The ARARs appear to be largely correct. Please note, however, that EPA generally requests that a column entitled “Prerequisite” be included so that all may clearly understand the action/location/chemical that triggers the requirement. Instead of a “Prerequisite” column, there is one entitled, “Comment,” which in some cases appears to describe the trigger, but not in all cases. Please replace “Comment” with “Prerequisite” and verify that the text accurately describes the prerequisite or triggering action for the requirement

Response: *This change has been made.*

**RESPONSE TO FDEP COMMENTS
ON DRAFT ROD FOR SITE 41**

**FORMER PESTICIDE STORAGE BUILDING 1485C
NAS WHITING FIELD**

FDEP comments issued September 9, 2010, from Mr. John Winters, FDEP, to Mr. Tread Kissam, RPM NAVFAC SE.

1. **Overall Comment:** Please match the data in the ROD to the latest version of the site's Feasibility Study (FS). After a quick scan of both documents I know the estimates of the excavation sizes are slightly different. Other things may need to be edited as well.

Response: *These changes and updates have been made.*

2. **Description of Selected Remedy, Page 2:** In the first sentence of the main paragraph please remove "industrial SCTLs" and replace with "FDEP direct exposure commercial/industrial soil cleanup target levels (SCTLs)".

Response: *This change has been made.*

3. **Statutory Determinations, Page 2, Second paragraph:** At the end of this paragraph please talk about the yearly LUC reviews that will be conducted as well.

Response: *The following text has been added to this section of the ROD on Page 3:*

"In addition, annual LUC compliance inspections will be conducted."

4. **Site History and Enforcement Activities, Page 5, Table 2-1:** In the RI Report and FS row please add a comment mentioning additional soil delineation is required prior to completing any remedy at the site.

Response: *The following text has been added to Table 2-1 in the requested row under the "Activities" column:*

"Additional soil delineation will be required prior to implementation of a remedy."

5. **Community Participation, Page 6, Third paragraph:** Complete these dates when they are known.

Response: The dates (January 10 to February 9, 2011) have been updated in the text.

6. **Basis for Action, Page 12, First paragraph:** Please rewrite the second sentence to something like "Of these contaminants, cPAHs and dieldrin exceed the FDEP industrial SCTLs in Chapter 62-777, Florida Administrative Code (FAC.), Table II, and all contaminants exceed FDEP residential SCTLs by up to two orders of magnitude".

Response: The sentence has been revised per the language agreed upon by USEPA, FDEP, and the Navy (see March 7, 2011 e-mail from Craig Benedikt) and now reads as follows:

"Of these contaminants, cPAHs and dieldrin exceed Florida's industrial SCTLs in Chapter 62-777, Florida Administrative Code (F.A.C.), Table II, and all four contaminants exceed the residential SCTLs up to two orders of magnitude."

7. **Basis for Action, Page 12, Second paragraph:** Please add ", following additional soil delineation," between "Site 41" and "will".

Response: This change has been made.

8. **Removal Action Objective, Page 12, Last paragraph:** Please correct the typo "SCLTs" to "SCTLs".

Response: This change has been made.

9. **Description of Remedial Alternatives, Page 13, Table 2-5:** In the Alternative S41-3 row, under the Details column, there are two "with clean" in the description. Please remove one.

Response: This change has been made.

10. **Modifying Criteria, Page 15, Community Acceptance:** Complete these dates when they are known.

Response: The dates (January 10 to February 9, 2011) have been updated in the text.

11. **Rationale for Selected Remedy, Page 16, First paragraph:** In the first sentence, please add "FDEP" between "meet" and "Industrial".

Response: *This change has been made.*

12. **Description of Selected Remedy, Page 16, First paragraph:** Won't the LUCs restrict the site to non-residential uses only, along with prohibiting soil excavation or disturbance?

Response: *Yes, the last sentence in the first paragraph has been revised as follows:*

"...(2) LUCs to restrict site to non-residential activities only and to prohibit soil excavation or disturbance."

13. **Expected Outcomes of Selected Remedy, Page 18, Table 2-7:** In the comments column, in the second paragraph, I believe it should say "by preventing residential use" instead of non-industrial use.

Response: *Agreed, the second paragraph in the "Comments" column of Table 2-7 has been revised as follows:*

"LUCs will limit exposures via ingestion, dermal contact, and inhalation that result in unacceptable risks under a hypothetical future residential use scenario by preventing residential use and by preventing uncontrolled excavation of soil from the site."

14. **Statutory Determinations, Page 19, First paragraph:** Please change "provide" to "provides" in this sentence.

Response: *This change has been made.*

15. **Statutory Determinations, Page 19, Five-Year Review Requirement:** At the end of this paragraph please talk about the yearly LUC reviews that will be conducted as well.

Response: *The following sentence has been added as requested:*

"In addition, annual LUC compliance inspections will be conducted."

Response to USEPA Comments on Draft Final ROD (provided November 1, 2011)

USEPA <u>Comment No.</u>	<u>Reference</u>	<u>Comment</u>	<u>NAVFAC SE Response</u>	
1	Section 1.5, Page 2	In the first sentence of the second paragraph, please change "unrestricted use and unlimited exposure" to "unlimited use and unrestricted exposure" to be consistent with the use of the terms in the National Oil and Hazardous Substance Pollution Contingency Plan (NCP). In addition, please make this change elsewhere in the document where this term is used.		Concur with comment. The phrase "unrestricted use and unlimited exposure" has been changed to "unlimited use and unrestricted exposure" through out the ROD.
2	Section 1.7, Page 3	Please change the authorizing signature for the Navy to reflect the recent change of commanding officers at NAS Whiting Field.		The authorizing signature has been updated to reflect the recent change of command at NAS Whiting Field.
3	Figure 1, Page 4	Please enlarge this figure to enhance its readability.		The figure has been enlarged for improved readability.
4	Section 2.3, Page 6	In the third sentence of the first paragraph, please change "officials" to "citizens" as it is the local citizens who attend RAB meetings not the local officials.		The word "officials" has been changed to "citizens" to reflect the composition of the RAB. This comment has been extended to other portions of the ROD as appropriate.
5	Figure 2-3, Page 8	Please enlarge this figure to enhance its readability.		The figure has been enlarged for improved readability.
6	Section 2.12.2, Page 17	This section should include an explanation as to why the particular LUCs were chosen. For example, the following land use controls (LUCs) were chosen to be implemented at the site but there is no explanation as to why these four were chosen: Amendment to the Base Master Plan, Utilization of the existing Excavation Permitting process, Deed Restrictions and the placement of signs.		This section has been revised to include and explanation as to why the four particular LUCs were chosen.
7	Section 2.12, Page 17	The "Selected Remedy" section should have a subsection on Cost, pursuant to the ROD guidance. Even though costs are discussed in the alternatives section of the ROD and listed in a table, the costs associated with the selected remedy should be discussed in the text of the document.		A subsection, in the "Selected Remedy" section, has been added to discuss the costs associated with the selected remedy.
8	Figure 2-4, Page 18	Please enlarge this figure to enhance its readability. In addition this figure should include a rough estimation of where LUCs will be incorporated at the site. The location of the LUCs will be further refined in the remedial design.		The figure has been enlarged for improved readability. The LUC boundary is displayed on the figure.

Response to USEPA Comments on Draft Final ROD (provided November 1, 2011)

9	Section 2.13, Page 19	<p>The "Protection of Human Health and the Environment" subsection should also state that the implementation of the remedy does not pose short term risks or cross-media impacts. In the "Utilization of Permanent Solutions" subsection, the second sentence should summarize what the volume and type of waste is rather than stating "Based on the volume and type...". That is, it is relatively broadly distributed soil, contaminated with low levels of hazardous substances, for which treatment did not represent the best balance of options. In the "Preference for Treatment as a Principal Element" subsection, the text should distinguish that the remedy does not meet the statutory preference for treatment (for similar reasons stated in the "Utilization" bullet), but also restate that there are no principal threat wastes at the site.</p>	<p>The sections on "Protection of Human Health and the Environment", "Utilization of Permanent Solutions", and "Preference for Treatment as a Principal Element" have been updated to reflect this comment.</p>
10	Section 2.14, Page 20	<p>In the second sentence, please change "hearing" to "meeting".</p>	<p>The term "hearing" has been changed to "meeting". This change was also made in Section 3.1.</p>
11	Appendix B	<p>There are no costs associated with conducting Five Year Reviews provided on Page B-4. Since the costs of conducting Five Year Reviews are associated with leaving hazardous substances onsite, they should be included in the total cost of the remedy. Please also include this information in the Section 2.12.</p>	<p>The cost of conducting Five Year Reviews has been included on Page B-4 and within the text of the "Cost" subsection of Section 2.12 and other sections of the ROD as appropriate.</p>